Virginia Medical Monthly

Vol. 80, No. 7
WHOLE No. 1213

RICHMOND, VA., JULY, 1953

$2.00 A YEAR
25 CENTS A COPY

GUEST EDITORIAL

Prevention of Kidney Stones: A Challenge to the Internist

THE passage of a kidney stone, so often ushered in by excruciating pain, and not infrequently accompanied by bleeding, is usually an event of startling importance to its victim. If it does not take him forthwith to his doctor, it leaves an impression seldom forgotten and often pathognomonically clear when brought to light in a medical history.

To the internist who hears the story, the immediate problems—relief of pain and removal of the stone or stones that may remain—are fairly straightforward. With one notable exception, stones of all types may be readily located by x-ray, and if forced fluids will not dislodge them, a surgical colleague, by snare or incision, can.

Unfortunately, the problem often rests here. The patient once "cured" has little incentive to pay for expensive laboratory tests; the busy doctor's attention is claimed by more immediate and pressing problems. This is regrettable for two reasons. First, the investigation of the cause of the stone's formation may lead the internist to an underlying and more important disease not previously suspected. Second, only by such an investigation can the internist establish the rationale for the successful prevention of further stones—indeed, he may thus be enabled to anticipate and prevent stone formation in members of the patient's family. In this essay we propose to examine briefly the causes and prevention of kidney stone formation.

In general, stone formation requires three conditions in the urinary tract: the presence of poorly soluble material, insufficient quantities of water to keep this material in solution, and, in most, perhaps all cases, a nidus (cells, fibrin, bacteria) on which the stone may start. The last two conditions favor the formation of all types of stones, and the therapeutic and preventive implications—forcing of fluids and elimination of infection* are obvious. The cause and prevention of the first will depend upon the type of stone being formed.

"Pure" stones are composed of calcium phosphate, calcium oxalate, uric acid, or cystine. "Mixed" stones are most often composed of the first two, but either of the others may form a nidus on which calcium salts are deposited.

If the patient has a stone in his possession—and they are often treasured—determination of its type is a simple matter for a chemical laboratory. If he does not, a good x-ray[1] may provide evidence almost as good.** Thus, the "snowflake" appearance of the calcium oxalate stone, the lamellated structure of the calcium phosphate stone, and the amorphous, "waxy" pattern of the cystine stone may be readily ascertaind from "in vivo" roentgenograms, whereas the uric acid stone will not show up at all against

*Permanent eradication of infection, however, is virtually never possible until all stones have been removed.

**Indeed, an x-ray of the stone itself may provide convincing evidence of its composition.

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the soft tissues. If a staghorn stone is present, it is always either calcium phosphate or cystine.

The search for the cause of *calcium oxalate and calcium phosphate stones* may lead the internist to abnormalities involving the patient's bones, his parathyroid glands, his kidneys, or his dietary and drug habits.

Decreased bone formation, or osteoporosis, while it is developing, leads to hypercalcuria and often to stones. The normal serum calcium, phosphorus and alkaline phosphatase and the presence of the lamina dura about the teeth serve to distinguish it from other metabolic bone diseases. The cause (extensive immobilization, the postmenopausal state, etc.) is often amenable to therapy.

Destructive lesions of bone often lead to stones. Tumor, originating in marrow or metastatic, or Paget's disease may be evident when sought for. In these conditions, the serum calcium may or may not be elevated; the serum phosphorus is usually normal; the serum alkaline phosphatase may be normal (myeloma) somewhat elevated (other tumor) or very high (Paget's); the lamina dura is preserved. In contrast, in osteitis fibrosa cystica resulting from hyperparathyroidism, the serum phosphorus is low and the lamina dura lost.

Hyperparathyroidism without bone disease, wherein the serum calcium is elevated and the phosphorus is low, but the alkaline phosphatase, the bones, and the lamina dura are normal, is equally capable of producing renal stones.

Renal lesions leading to hypercalcuria include "essential hypercalcuria" and "renal tubular acidosis". In both, the serum calcium is low normal, the phosphorus low. The serum alkaline phosphatase may be normal in either, or elevated in the latter, where in addition the serum chloride is elevated and the bicarbonate depressed. The renal lesion in tubular acidosis, involving as it does a failure of acidification of the urine, provides a further impetus to stone formation because of the decreased solubility of calcium phosphate at high pH. Pyelonephritis often provides conditions unusually favorable for the formation of phosphate stones. Besides supplying a nidus, it may reduce urinary citrate (and thus increase the concentration of calcium ions) and, by damage to the renal tubules or by the action of 'urea splitters,' produce a persistently alkaline urine.

Abnormally high intake or absorption of calcium may lead to hypercalcuria, and thus to phosphate or oxalate stones. Thus, it is apparent that Vitamin D in the therapy of arthritis and milk and calcium salts in the therapy of ulcer are not without danger. In the latter instance, the practice of adding alkali to the regimen even further increases the chances of stone formation. Finally, calcium oxalate stones may result from an abnormally high content of oxalate (beet greens, rhubarb, spinach, etc.) in the diet.

Uric acid stones may be indicative of an elevated serum uric acid, which may in turn point to gout. In most patients with uric acid stones, however, the serum uric acid is normal. There is some evidence that a chronic infectious disease, producing a "chronic alarm reaction" may by increased destruction of lymphoid tissue predispose to uric acid stones. An abnormally high intake of purine-containing foods (pancreas, thymus, liver, etc.) may lead to increased urinary uric acid, and its precipitation as a stone.

Since the urate ion is relatively soluble, uric acid stone formation, once recognized, is generally easy to prevent. One needs only to administer enough alkali to keep the urine neutral or alkaline, to limit dietary items especially rich in uric acid, and, of course, to keep the urine volume high.

Cystine stones are virtually always indicative of congenital cystinuria, a hereditary

renal disease in which a number of amino acids are excreted in excess and cystine, being the least soluble, often forms calculi.

Although the ingestion of methionine (but not, surprisingly, cystine) increases the amount of cystine excreted, this point is of little therapeutic importance, owing to the omnipresence of methionine in protein foods. However, since cystine, like uric acid, is relatively soluble at alkaline pH, formation of cystine stones may also be prevented (indeed, preexisting stones may be dissolved) by administration of enough alkali to keep the urine neutral or alkaline.

The diagnosis of cystinuria may be readily made by testing the urine for cystine*; in this way the condition may be diagnosed, and stone formation discovered or prevented, in the relatives of a patient with cystine stones.

In summary, the patient with a kidney stone presents to the internist both a valuable diagnostic clue and an unusual opportunity for preventive medicine.

FREDERIC C. BARTTER, M.D.

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[1] Albright, F. Some Medical Aspects of the Renal Stone Problem, N.E.J. Med., 217: 1063, 1937.

*To 5 cc. of urine is added: ammonium hydroxide until it is alkaline, and 2 cc. of 5% sodium cyanide. After 10 minutes, 5% sodium nitroprusside is added dropwise. A stable purple-red color is formed in the presence of cystine.

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Floral Eponym

WELWITSCHIA

WELWITSCH, FRIEDRICH, 1806-1872

Welwitsch was an Austrian physician and scientist. He went to Lisbon for a short visit, but became so much engrossed by the flora of Portugal that he stayed fourteen years. The genus Welwitschia is named for him.

Welwitschia mirabilis is the only species of this genus. It is found in two isolated and restricted areas of the coastal desert region of Damaraland in South-west Africa.

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THE PHYSICIAN AS CITIZEN*

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The word *citizen* can be used correctly only in speaking of a free and democratic people. You can not be a citizen in a monarchy, in an oligarchy or in a police state. It is hard to be a citizen in a bureaucracy. The word, and the privileges inherent in it, were honored in ancient Rome and abused in Revolutionary France.

A good citizen in a democracy recognizes and accepts responsibility to his state and to his community. It is the price he must pay for his freedom. He permits no selfish ambition to divorce him from his duty as a citizen. He is willing to devote his time, energy and substance to the betterment of his community and his fellows. Without this sort of citizen-service no democracy can long survive.

Now, what of the doctor as citizen? Surely no class in the body politic should be better able to play the role of good citizen. For what class has been blessed with a better education? Using the word to imply knowledge, not only technical and scientific knowledge, but on a higher moral plane, knowledge of right and wrong. Who as a class should have a better understanding of the meaning and extent of human suffering? Who should have a heart and mind better able to assess human need? Who should be better able to chart a course of sanity through the mounting appeals that daily come to us all through the mails, who better able to steer safely between the Charybdis of ignorance and the Scylla of sentimentalism? And what group is better able than our profession to support financially public charities and eleemosynary institutions?

Let us face the facts implicit in this last rhetorical question. Once the doctor was considered a poor business man. But time marches on. The physician no longer practices an empirical art from a pair of well-worn saddle bags, which cost little and contained little. His is now a highly specialized kind of medicine which cost him years of expensive training and thousands of dollars in capital outlay to continue. Some say he has trained himself too well as a businessman, taking the cash too avidly and letting the credit go too recklessly. But without subscribing to that devastating point of view, one must admit that a profession in which the average member has an annual net income of over $12,000 cannot plead the wolf at the door. Nor can the doctor claim that charity work exempts him from giving dollars to good causes. If we admit that the doctor's collections are as good as the merchant's around the corner, we must also admit that his free work in clinic and ward and classroom is a part of his continuing education, and a part of the prestige that brings him in still more dollars. In short, the doctor, like any other citizen, must assume his share of giving to worthy causes, and I think he does.

In the long annals of time, doctors have contributed richly to all phases of civilization and culture. They have been artists, poets, historians, philosophers, geologists, explorers, soldiers, statesmen and administrators. Keats, Goldsmith, Bridges, Holmes, Locke, and Rabelais, Sir Thomas Brown and Conan Doyle, Rudolph Virchow, Leonard Wood and George Clemenceau are but a few examples. And for every such great name there have been thousands who played their dual role on a less well lighted stage. What is true of the past, is true today. We meet our confreres all over the place, discharging the manifold duties of citizens, going to the polls, debating public issues, accepting public office, prominent in church work, in the business world, on boards of banks and other institutions, acting as trustees of schools and colleges. Doctors are seen on the golf course, at the club, and at the ball game, wherever fellow citizens work and play.

In one particular phase of community work the doctor is destined, I believe, to play an increasingly important role as citizen, because of his education and training. The fact that medicine as a science concerns all the people, puts the responsibility upon the physician of educating the public in the development of the facilities needed for adequate medical care. The fact that this year, out of around 500 practicing physicians in the city of Richmond, more than 130 are taking an active part as workers and solicitors in the special gifts drive of the Community Chest, is not only indicative of the prominent part doctors are playing in such community health and welfare projects, but it is also indicative of an ex-

*Read before the annual meeting of The Medical Society of Virginia in Richmond September 28th-October 1, 1952, as one of several informal talks on the Socio-Economic Problems of Medicine.

tremely happy and logical closeness between the Richmond Academy of Medicine and the city's private and public agencies that have to do with health and welfare in the initial planning stage and in the succeeding stages of execution. Our local health department has acted for years in the enlightened belief that the strength of any public health service depends upon the good relationship it maintains to the members and purposes of our Academy. The Health Division of the Community Chest Council has always seen fit to seek and utilize at every stage of its planning the guidance of the medical profession. This willingness to seek expert advice on medical problems has given Richmond many advantages of which to be proud.

It has given to Richmond's indigent population its present model system of home care, a system which gives not only a superior type of medical service to the poor of the city, but affords the senior medical student at the MCV an exercise in extramural general practice that has been woefully lacking in medical education in the past.

On the state level we now enjoy the distinction of supporting one of the best medical examiner systems in the United States, recognized by the American Bar as one worthy to be imitated. Who gave us this system? Not the administration; not the police, not the lawyers, not even the legislature, but the medical profession, assuming the burden of medical leadership that rests upon them as citizens to mold and guide public opinion.

A multiphasic screening clinic examined more than 37,000 people for chronic diseases here in Richmond several years ago, under the approval of the U.S. Public Health Service, the local health department and the Richmond Academy of Medicine. Committees of doctors, acting with other citizens, screened the screeners, evaluated the good and bad points of the scheme, prescribed bounds, and so modified and controlled the operation of the clinic as to make it a useful demonstration rather than an inroad of socialized medicine.

The phrase "socialized medicine" has become a red flag to the medical profession. Since the recent administration would make our backyard the proving ground for socialism itself, these words should become a call to arms to the citizen doctor to take his rightful place as a leader in that field where the social impact of medicine is becoming increasingly manifest.

Summer Vacations

Don't forget to let your patients know when you plan to be away on vacation. Explain the arrangements you have made for taking care of them during your absence.

XUM

RECOGNITION OF PRE-ECLAMPSIA AND PRE-HOSPITAL THERAPY OF PRE-ECLAMPSIA*

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Toxemia of pregnancy is now the leading cause of maternal deaths in the State of Virginia. During the year 1951, thirty mothers died from toxemia as compared with nineteen from infection, and sixteen as a result of hemorrhage. In 1952 there was a definite decrease in the total mortality, but toxemia was again the leading cause of death—nineteen mothers dying as a result of this complication. In the neighboring State of North Carolina, a survey of 1,000 maternal deaths, occurring between the years of 1946 and 1951, likewise showed toxemia more frequently as the primary cause of death than any other one factor. Of those dying from other conditions, many had an associated toxemia that probably influenced the course and management of the case, and indirectly may have been responsible for some of the fatalities.

DEFINITION AND CLASSIFICATION OF TOXEMIAS

In April of this year, the American Committee of Maternal Welfare adopted a report developed by a sub-committee on the definition and classification of toxemias of pregnancy. The report is simple, concise, and a complete picture of our knowledge of the toxemias of pregnancy.

The practicing physician who is familiar with this report will find it an aid in the recognition of early toxemia. Pre-eclampsia is classified as an acute toxemia (one of the various types). To observe for one is to observe for all. Toxemias are defined as a disorder encountered during gestation, or early in the puerperium, that is characterized by one or more of the following signs: Hypertension, edema, albuminuria, and, in severe cases, convulsions and coma. Criteria for classifying a case of toxemia as described in this report is as follows:

HYPERTENSION: The presence of a systolic blood pressure of 140 mm. of mercury or above, and/or a diastolic pressure of 90 mm. of mercury or above. It is interesting to note that the Committee also describes as a criteria an elevation of systolic pressure of 30 mm. of mercury or more, and/or an elevation in diastolic pressure of 15 mm. of mercury or more. Is not this factor, the amount of blood pressure rise during a pre-natal course, a more significant means of observing abnormalities than accepting the usual level of 140/90?

EDEMA: The diagnosis of toxemia on the basis of edema alone (without hypertension or albuminuria) is to be made *only* when the edema involves the face and/or hands; when it is present in the morning and is of sufficient degree to be detected clinically, as well as by a weight gain.

A weight gain of 5 pounds in one week, together with evidence of face and/or hand edema, justifies the diagnosis of toxemia even in the absence of hypertension and albuminuria.

ALBUMINURIA: The diagnosis of toxemia on the basis of albuminuria alone (without hypertension or edema) is to be made *only* when a clean or catheterized urine specimen shows an unequivical cloud (1 plus) with a glacial acetic acid test, or 1/2 gram per 24 hours with Esbach procedure on two or more successive days,—or by any generally approved test.

PRE-HOSPITAL THERAPY OF PRE-ECLAMPSIA: Of the 1,000 maternal deaths referred to in the report, 264 showed toxemia as the primary cause. Of these 264, 110 deaths were attributed to improper management of the case on the part of the physician. A report from the Chairman reads as follows:

> "The errors in management were almost 100% the failure to hospitalize the patient. Once the patient had been admitted to the hospital, the physician as a rule handled it well with sedation, concentrated glucose, magnesium sulfate and supportive measures. However, most of this group represents patients who were carried as out-patients with rather severe toxemia."

The above comment is a clear picture of the results obtained in a situation that exists in our hospitals not uncommonly. Too often the patient with toxemia is not hospitalized until labor begins or the condition is critical. There are many physicians practicing obstetrics who are early to recognize and properly treat many of the obstetrical complications.

*Read at the meeting of The Medical Society of Virginia in Richmond, September 28-October 1, 1952, as one of the Round Table Discussions of Obstetrical and Gynecological Problems.

but fail to recognize and properly treat toxemia in its early stages. Occasionally, because of environmental, financial, and other factors, it becomes necessary to attempt treatment in the home, but this is usually met with failure and the patient is subsequently hospitalized under more adverse circumstances. Therefore, because of the tremendous mortality described above, due to the failure of the physician to hospitalize the patient, and because of the incidence of failure in home treatment, it may be concluded that once a definite diagnosis to toxemia or pre-eclampsia is established, hospitalization is not only of value but is a necessity.

Certain signs develop during the pre-natal period that suggest an impending toxemia. Of these, an increasing blood pressure and an excessive weight gain are those signs which may be detected, and the individual properly treated before reaching a state that warrants a definite diagnosis of toxemia. A weight gain of 2½ pounds or more in one week does not justify the diagnosis but is to be considered a warning. Frequent and careful examinations are essential to detect the development of these unfavorable signs. In the presence of a rising blood pressure, or excessive weight gain, or the development of clinical edema, limitation of activity is necessary. This may necessitate obtaining aid in performing household duties and refraining from participation in laborious employment and social functions.

Administration of a sedative may assist in securing an increased amount of rest. Excessive weight gain, or development of clinical edema may be controlled by a more rigid diet, restriction of sodium intake, limitation of fluids or administration of one of the diuretics, such as ammonium chloride. *Above all, rest is the most important.*

SUMMARY

In summary, it may be stated that pre-eclampsia, one of the toxemias, is a complication of pregnancy. Criteria for establishing a diagnosis of toxemia is based on the development of hypertension, edema, or albuminuria. Certain signs may be detected by careful and frequent observation of the patient that suggest an impending toxemia, and upon the early institution of therapy a toxemia may be prevented. But once a diagnosis of toxemia is established, an obstetrical complication does exist and hospitalization is indicated. There is no satisfactory pre-hospital therapy for pre-eclampsia.

1204 Colonial Avenue.

A.M.A. Distributes 3 Million Pieces of Literature.

A.M.A. Public Relations Director Leo Brown reports that more than 3,000,000 pieces of literature were distributed to physicians and the public during 1952. The literature represented 17 pamphlets produced by the A.M.A. and 11 reprints from other publications.

Of the A.M.A. literature, the pamphlet, "Your Money's Worth in Health," got the widest distribution with 1,155,780 copies. "A Doctor For You" followed with a distribution of 412,409 copies. Reprints from other publications totaled 855,397, with the pamphlet, "A Doctor As Near As Your Telephone," from the Reader's Digest, numbering 239,053 copies.

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ADENOCARCINOMA OF THE URINARY BLADDER

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Adenocarcinoma of the bladder is a rare tumor. Eisendrath and Rolnick have pointed out that ninety-five per cent of bladder tumors are of epithelial origin. Of this number only 1.8% are adenocarcinoma. Dean and Ash reported 69 cases of adenocarcinoma in 5,324 tumors of the bladder. In a review of the literature, Loeb was able to find 50 cases of mucinous adenocarcinoma and added one of his own. However, he failed to include a case reported by Bandler and Roen and one by Armstrong and Harlin.

Adenocarcinoma of the bladder occurs in both sexes but is seen more frequently in the male. Armstrong and Harlin state that 75% of cases occur after the fifth decade. Abeshouse reports an adenocarcinoma in a patient twenty-three years of age who had exstrophy of bladder. Bandler and Roen's patient was an eighty-six year old male.

Pathogenesis: There are two types of adenocarcinoma—one secretes mucin, the other does not. The mucinoid type occurs more frequently. Most authors in their reports include both types and no effort is made to separate the two types.

Under normal conditions, the bladder does not possess glandular structures that may serve as foci other than in the trigonal region where subtrigonal glands are normally found. To explain the origin of glandular tumors several theories have been formulated and from such we may arrive at some conclusion as to their origin.

It is the opinion of most authors that these glandular tumors have their origin in one of three ways: (1) Those that develop from urachial remnants and misplaced germinal cells inclusions of the gastrointestinal tract. (2) Those that arise from glands which are found in the trigonal region, and (3) Those that result from metaplasia of the bladder epithelium which is probably due to chronic inflammation or irritation with formation of cell nests of Brunn, cystitis cystica, and cystitis glandularis which are considered by many to be precancerous lesions.

The most common site of adenocarcinoma is the dome of the bladder. Because of this location, its origin is best related to the remnants of the urachus. It was found by Mollendorfs, and confirmed by Begg, that often the fundic portion of the normal bladder contains tubular structures in the region of the median umbilical ligament which represents the remnants of the urachus. This finding was also noted by Saphir and Kurland, who found these tubular structures in nine of ten normal bladders.

The urachus and remainder of the bladder except the trigonum, which is of mesodermal origin, is of entodermal origin arising from the primitive hindgut. The cloaca also gives rise to the rectum and is lined by a single layer of cuboidal cells. In the 5.3 mm. embryo the cloaca is divided into a dorsal (rectum) and ventral (bladder and urachus) portion by the down growth of the urorectal septum. Eventually, the cuboidal epithelial cells of the dorsal portion become cylindrical and secrete mucin, forming the normal intestinal epithelium of the rectum. The cuboidal epithelial cells of the ventral portion eventually becomes stratified into transitional epithelium to form a waterproof lining for the bladder. The epithelial lining of the urachus, which has no particular function, remains as cuboidal. Contrary to the views of many authors, the urachus is not a part of the allantois but is derived solely from the cloaca, as proven by Begg. Also, the urachial canal does not normally become a fibrous-like structure after birth nor does it extend from the umbilicus to the bladder. Begg has shown that the urachial canal is never obliterated by fibrous tissue but may become inpervious in parts due to its own cellar debris derived from its epithelial lining. He also demonstrated that its lumen is in direct communication with the bladder in 33-1/3% of cases and that normally the urachus descends with the bladder and extends only 1/3 of the way to the umbilicus, being connected to it by the fibrous cords from the obliterated umbilical arteries.

As mentioned above, the urachus remains as a primitive organ lined with cuboidal cells which possess the potentiality to differentiate into glandular or transitional epithelium. Since the bladder and rectum have a common origin from the cloaca, it is reasonable to assume that as development takes

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place, cell nest of intestinal epithelium may be retained within the bladder portion of the cloaca and later undergo malignant degeneraion, giving rise to adenocarcinoma in other portions of the bladder. Francois-Lacene and Hovelaque held this view and Gayet, after studying fifteen cases of adenocarcinoma occurring in exstrophic bladders, concluded that they arose from intestinal epithelial cell inclusions as there was arrested development of the mucosa which probably results because the bladder does not assume the role of a reservoir.

As stated above, no glandular structures are to be found in the normal bladder mucosa, other than in the region of the trigone. Albarron in 1862 described mucosal glands in the region of the trigone and bladder neck. The presence of these glands has been confirmed by other investigators who believed their origin to be from aberrant prostatic tissue. H. H. Young concluded that the glands occurring in the region of the trigone of the normal bladder resembled the glands of the prostate and posterior urethra, and that adenocarcinoma of the bladder resembled adenocarcinoma of the prostate. Keyes was of the opinion that such tumors arising from the base of the bladder have their origin from these glands. A similar view is held by Ash and Abeshouse.

Adenocarcinoma in the dome and about the trigone and bladder neck can be explained by one of the two above theories, but those occurring in other portions of the bladder cannot readily be explained by these theories; therefore, it is necessary to look for a further explanation.

The most logical explanation and one that is supported by an abundance of clinical and pathological material is that of metaplasia of the bladder epithelium to form glandular structures which logically should develop in that portion of the epithelium which possesses this potentiality, that is the trigone. It is known that bladder mucosa when stimulated by chronic inflammation or irritation may result in cystitis cystica, follicularis and glandularis. Giani was able to reproduce these lesions in the bladder of laboratory animals by using various irritative stimuli. Patch and Rhea were able to trace the formation of cell nest of Brunn to cystitis cystica and glandularis arising from the mucosa of an exstrophied bladder and were of the opinion that cystitis glandularis had the potentiality to develop adenocarcinoma.

It is generally agreed that metaplasia of the bladder mucosa to develop cystitis cystica and cystitis glandularis has as its chief etiological factors, chronic inflammation or irritation. These lesions develop first by proliferation of the inferior layer of the bladder epithelium to form peg-like buds projecting into the submucosa. These peg-like buds were first described by Limbeck and Brunn and are commonly known as Brunn's cell nests.

Stairk and Zuckerhandl were the first to advance the theory that cystitis glandularis could undergo further changes into adenocarcinoma and presented a case in support of their theory.

The above theories refer only to the origin of primary adenocarcinoma occurring within the urinary bladder. Of course, adenocarcinoma may invade the bladder from neighboring organs that contain glandular epithelium, such as the uterus, rectum, intestines, prostate, seminal vesicles, etc., and may present some question as to whether or not the tumor is of primary or secondary origin. However, by a careful history, physical examination, laboratory studies, and X-ray examinations, these sites of origin may be excluded.

CASE REPORTS

Case I. H. T., a 27 year old white male was first admitted to McGuire V. A. Hospital in August, 1948, complaining of terminal hematuria for some three months. He had consulted his local physician prior to his admission and was cystoscoped on two occasions and fulguration was attempted but the patient objected because of pain. His physical examination was essentially negative except that the prostatic secretion was loaded with pus cells. Cystoscopic examination did not reveal evidence of recent fulguration, but the posterior urethra was inflamed. Hematuria was not present during this admission and he was discharged with a diagnosis of chronic prostatitis and posterior urethritis. He was not seen again until one year later at which time he was admitted with the same complaint, which he stated came back shortly after he was discharged and had been present intermittently for the past eleven months. His physical examination was again negative except for an infected prostate. Cystoscopic examination on this admission revealed a severe posterior urethritis with papilloma formation at the bladder neck. These were removed transurethrally and the pathological report was chronic inflammatory papilloma.

He was readmitted one year later, two years from

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the time of his first admission complaining of terminal hematuria with burning and smarting. Cystoscopic examination revealed a large pedunculated tumor arising in the dome of the bladder. A biopsy was taken and reported as adenocarcinoma. At operation the urachus was found to be attached to the bladder in the region of the tumor. The entire dome of the bladder was removed with the tumor. The pathological report was the same, adenocarcinoma containing mucin (Fig. 1). His post-operative course was uneventful and he was discharged some three weeks later to have a follow-up examination in sixty days.

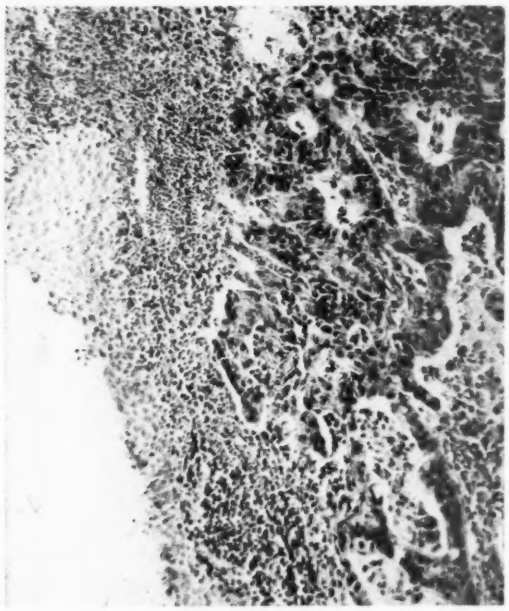

Fig. 1.—(Case 1) Adenocarcinoma of bladder (H & E Stain). Note submucosal inflammatory reaction and hyperplasia of intact mucous membrane.

However, this patient was in the Naval Reserves and was called back to active duty shortly after discharge from the hospital and served for eighteen months. Upon discharge from the Navy he reported back to this hospital in March, 1952, and cystoscopic examination revealed a small recurrent tumor in the dome of the bladder in the old scar of the previously excised bladder. Subtotal cystectomy was again carried out and he was discharged in good condition. Cystoscopic examination after nine months failed to reveal any evidence of recurrence. He is being followed in our Clinic.

Case II.—R. H. This 61 year old colored male was admitted to McGuire V. A. Hospital January 10, 1951, complaining of difficulty in voiding since July, 1950. He had occasional hematuria with nocturia 4-5 times and loss in force and size of stream. Physical examination showed an essentially normal colored male except that on rectal examination a hard nodular mass was felt just above the prostate and extending into the region of the bladder. Laboratory studies showed pus and blood in his urine with a normal acid and alkaline phosphatase. However, excretory urograms and K.U.B. X-rays revealed bilateral hydronephrosis and hydroureter. On cystoscopic examination there was a large median lobe of the prostate and just beyond the median lobe in the bladder a tumor mass was noted which on biopsy revealed adenocarcinoma with marked production of mucin (Fig. 2).

Fig. 2.—(Case 2) Adenocarcinoma of bladder (P.A.S. Stain). Note marked mucin production.

On January 17, 1951, at operation, a tumor mass was found in the floor of the bladder involving both ureteral orifices. The tumor was removed by loop cautery and the base fulgurated. His post-operative course was noneventful and he was discharged February 8, 1951, to be followed in the Clinic. He was checked in April and given 7600 Gamma Roentgens. Following the radiation therapy his bladder symptoms became worse and within three weeks X-rays

demonstrated the left kidney to be non-functioning and the right almost obstructed. A right nephrostomy was performed in May, 1951, following which the patient's symptoms improved and he was discharged in June.

Since his discharge he has been followed in our Clinic. However, the tumor mass of the bladder has steadily increased in size as determined by rectal examination. He has received 25 mgms. of stilbesterol daily.

Case III.—J. C. D. This 52 year old white male was admitted to the Urological Service on January 10, 1952, because of intermittent hematuria over a period of two years. He was seen by several urologists who told him he had kidney stones. Physical examination was essentially normal. Laboratory studies revealed pus and blood in his urine. X-rays

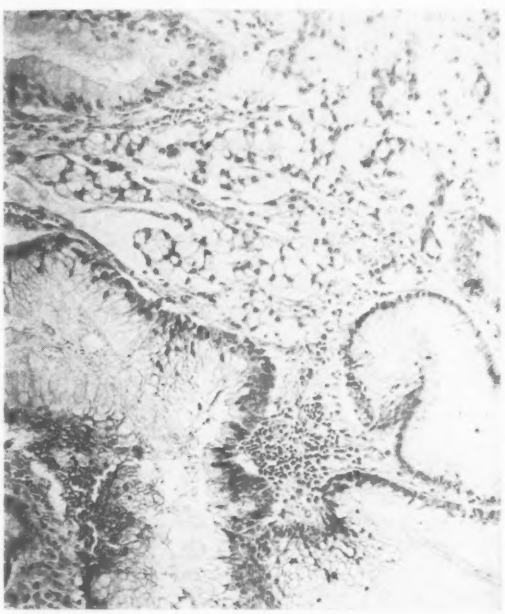

Fig. 3.—(Case 3) Adenocarcinoma of bladder (H. & E. Stain).

showed bilateral nephrocalcinosis. Laboratory studies failed to demonstrate evidence of hyperparathyroidism. Cystoscopic examination was performed and a large tumor mass was seen at the dome of the bladder and a biopsy taken was reported as adenocarcinoma with mucin (Fig. 3). On January 24, 1952, a subtotal cystectomy was carried out with what was thought to be an adequate margin, but pathological report showed infiltration to the cut edge. Bilateral ureterointestinal transplant and total cystectomy was carried out on February 28, 1952, and his first week post-operative course was satisfactory. After this, he began to have symptoms and signs of intestinal obstruction and his abdominal wound ruptured. The surgical service concurred in the diagnosis of intestinal obstruction. Immediate laparotomy revealed two portions of the small bowel to be obstructed. These were relieved and his abdominal wound repaired with wire stay sutures and cotton. His immediate post-operative course was satisfactory but about eight days later he began to have distention with the passage of fecal material from his abdominal wound. His progress was then steadily downhill and he expired on March 18, 1952. A post-mortem revealed a fecal fistula and generalized peritonitis probably caused by a suture which passed through a loop of ileum. The transplant had healed and there was no evidence of leakage or malfunction.

COMMENT

Because of the location (dome of bladder) of the tumors in Cases 1 and 3, one would probably assume that these tumors had their origin from cell remnants of the cloaca. But on closer analysis, it is found that in Case 1 there was a history of extreme trigonitis and posterior urethritis with fulguration of inflammatory papilloma on two occasions. In Case 3 nephrocalcinosis was present with evidence of long continued gross urinary tract infection. Therefore, it is entirely possible that the tumors in Cases 1 and 3 resulted from metaplasia as a direct result of chronic inflammation and irritation.

The tumor in Case 2, occurring in the base of the bladder behind the trigone in a region where glandular structures are normally absent, also probably resulted from metaplasia due to chronic bladder infection accompanying prostatic obstruction. This case was of further interest as on examination of the tissue several sections resembled the glandular structure found in adenocarcinoma of the prostate, while others demonstrated the presence of glandular epithelium containing mucin producing cells. It will be recalled that the trigone of the bladder distal to the ureteral opening and the posterior urethra as well as the prostate are of mesadermal origin. The remainder of the bladder and posterior urethra below the ejaculatory ducts are derived from entoderm. This is well exemplified by the case of a 22 year old colored male who on five occasions had undergone transurethral fulguration and excision of inflamma-

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tory tissue in the posterior urethra due to severe seminal vesiculitis.

Microscopic study of this tissue which had been removed from the region of the seminal colliculus, the epithelium above being of mesodermal origin, that below of entodermal, revealed glandular adenomatous tissue resembling prostatic tissue and other areas with mucin producing glandular areas (Fig. 4).

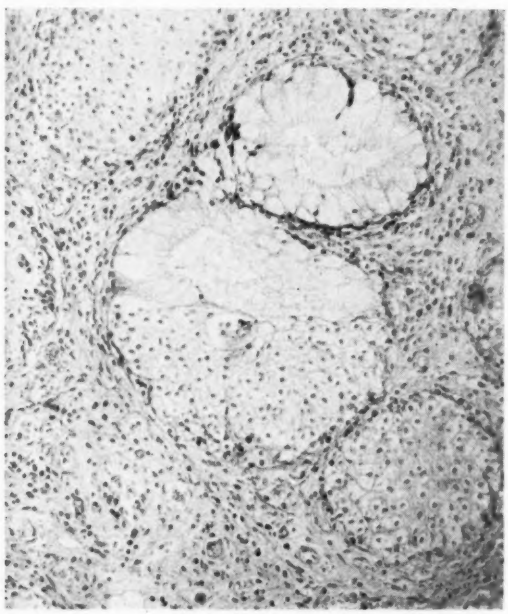

Fig. 4.—Adenomatous and early squamous cell metaplasia of posterior urethra (H & E Stain). Note central cell mass, the upper half consisting of mucoid cells and lower half of modified transitional cells.

Connery noted pyuria in 88.8% of 45 patients with leukoplakia; 20% of whom developed squamous cell carcinoma of the bladder. It is his opinion that chronic infection is an essential factor in the chain of events leading to the metaplastic changes resulting in leukoplakia and squamous cell carcinoma in many cases.

The effects of estrogen therapy or orchiectomy on prostatic cancer has been known for several years. Lich and Grant in 1949 suggested the use of stilbesterol on those tumors of the bladder that resembled adenocarcinoma of the prostate. The case cited above with glandular metaplasia who had been suffering from 1941 to 1948, has been relieved of all difficulties for the past three and a half years after receiving estrogen therapy for a period of three months.

SUMMARY

1. Three cases of adenocarcinoma of the bladder, all of which produced mucin, have been presented.

2. There are three generally accepted theories as to the origin of adenocarcinoma of the bladder: (a) Those that arise from the remnants of the urachus and embryonal cell inclusions; (b) those that are of mesodermal origin, arising from glands that are normally found in the trigonal and bladder neck regions; (c) those that arise from metaplasia of the bladder epithelium to form cell nests of Brunn, cystitis cystica, and cystitis glandularis which undergo further metaplasia to adenocarcinoma.

3. Chronic infection and irritation was present in all cases reported and probably plays a major role in the metaplastic changes, viz., cystitis cystica and glandularis that precede cancerous changes in the bladder mucous membrane.

4. Glandular metaplasia may resemble the glandular elements of the prostate or of the rectum, depending on its site of origin.

5. The type of adenocarcinoma should be determined and if of mesadermal origin resembling adenocarcinoma of the prostate, endocrine therapy and/or orchiectomy may be of benefit.

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Report ACTH Aids in Snake Bite Treatment.

Cortisone and corticotropin (ACTH) are valuable adjuvants in the treatment of snake venom poisoning, it was reported in the May 16 Journal of the American Medical Association.

Three cases in which children bitten by poisonous snakes recovered following cortisone or corticotropin therapy, in addition to standard treatment for such bites, were reported by Drs. William W. Hoback and Thomas W. Green, of the Clinch Valley Clinic Hospital, Richlands, Va.

"We have been impressed by the pronounced decrease in morbidity in these patients, as compared with 11 others seen in the last three years who did not receive cortisone or corticotropin," they stated.

In the three cases described by the doctors, the swelling, pain and elevated temperatures resulting from the bites subsided within a few hours after administration of the hormone drugs. Recovery occurred within a few days.

"The effectiveness of cortisone in these patients is probably due to its remarkable ability to inhibit local tissue reactivity to foreign protein [snake venom] and its symptomatic effects on pain and fever," the doctors stated. "An additional indication for cortisone or corticotropin therapy (not encountered in these patients) is the frequent generalized urticaria [hives] from the snake venom and from antivenom, especially in cases in which it is necessary to administer additional antivenom.

"It is noteworthy that all these patients were five years old or younger, and a generally poor prognosis would have been expected, because of their age and size.

"It is possible that in such a situation these agents may be life-saving."

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CESAREAN SECTION
PRESENT DAY TRENDS WITH REPORT OF CASES

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Cesarean section is the delivery of a child from the uterine cavity by means of an incision made through the abdominal and uterine walls. This term cannot properly be applied to the delivery of an ectopic abdominal pregnancy, nor to delivery through the vagina following vaginal hysterectomy.

The historical background and development of Cesarean section is both long and interesting. The exact origin of the name Cesarean section is obscure. During the reign of Numa Pompilius of Rome, a law was formulated requiring the excision of unborn babies from women dying late in pregnancy. This law was known under the Roman Kings as "lex regia" and later under the emperors as "lex caesarea". This being the most spectacular of the laws of the Empire, the term cesarean operation or section was presumed to have originated from this and it is now generally accepted as the most probable origin for the present name of this operation.

The operation on living patients was by no means unknown at that time, but had been mentioned in the Talmud and other ancient writings. The popular belief that the operation was so-called because Julius Caesar was supposed to have been born by this method, is unfounded. The history of the development of the operation through its various phases and refinements in technic through the years, is of the greatest interest. In this presentation no attempt can be made to recount the entire developments, but certain historical features have a direct bearing on variations in technic of the several different types of cesarean sections now used for different sets of conditions and indications.

Williams[2] and Stander[3] have discussed five developmental periods in this operation.

The first of these is that now ancient time during which operations were performed on living women but mostly those done on corpses under the *lex regia* and its successor, *lex caesarea*. Even today, post mortem cesarean sections are occasionally done under exceptional circumstances.

The second period began in the year 1500 and continued to the latter half of the last century. Reports of cesarean section on living women were common during this epoch, although uterine sutures were not used, and the mortality from hemorrhage and infection was appalling. Many of the successful cases reported during these three and a half centuries seem to have been cases of advanced abdominal pregnancies in which no uterine incision was required.

Rousset in 1581 and Renaud in 1637 published complete works on cesarean sections with records of successful cases. Guerriot found records of forty such operations in Paris from 1800 to 1870, but all the patients died. At that time, the use of sutures was still being debated.

The third period began in 1876 when Porro of the University of Milan advocated the amputation of the body of the uterus following cesarean section and the cervical stump sutured or skewered into the lower angle of the abdominal wound. Hemostasis was accomplished by means of an encircling wire snare. With so little knowledge of antisepsis or aseptic surgical technic, this procedure was a notable advance in lowering mortality from hemorrhage and infection. The present day operation known as cesarean hysterectomy or Porro cesarean section derives its name from this pioneer.

The fourth period began in 1822 when Sänger described an accurate method of suturing the uterine wound and thus conserving the organ for future pregnancies. Thus with this advance and increased knowledge of aseptic surgery, this operation became fairly safe and was known as the "conservative cesarean section", as distinguished from the Porro or radical cesarean section. Sänger is therefore the father of the present day "classical cesarean section".

The fifth and present period began in 1907 when Frank of Cologne undertook what was termed an extraperitoneal cesarean section, but his operation opened the peritoneal cavity and was actually not a true extra-peritoneal section. Latzko in 1909 first described his technic for extraperitoneal section, whereby he carefully dissected up the bladder peritoneum from its lateral attachments on one side until the lower uterine segment was exposed for incision and delivery of the child. However, in a large percentage of cases, the peritoneum was inadvertently torn open and the operation was technically difficult, but his

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results were good. Krönig contended that the peritonealization of the uterine wound was the effective feature in the operation of Frank, and he advocated cutting through the vesical peritoneum and entering the lower uterine segment after dissecting the bladder downward. Beck's transverse incision of the peritoneum and subsequent over-lapping of the replaced flaps are important modifications of Krönig's original operation.

Thus at the present time, we have available *four main types* of cesarean section:

(1) Modification of the Porro radical operation or cesarean with hysterectomy;
(2) The classical conservative operation of Sänger;
(3) The low cervical section of Krönig with modifications, and
(4) The Latzko extraperitoneal operation and its several modifications, notably that of Waters, Norton and others.

Time will not permit this presentation to describe the technic of the various types of cesarean section in detail, but a few general statements on the four main types may be appropriate. The lower uterine or cervical section possesses many advantages over the simple classical operation. Post-operative morbidity due to leakage of lochia, post-operative distention and vomiting and peritonitis are all materially reduced. It is also quite generally maintained that rupture of the uterus during a subsequent pregnancy or labor is more prone to occur following a previous classical type of incision in the upper uterine segment than following a lower uterine incision.

An operation which is safer for the potentially infected patient or one who has been subjected to a long test of labor, should logically be safer for all patients. The low cervical operation has therefore supplanted to a large extent the classical operation in modern obstetrical practice because of the above features of safety and prevention of infection or peritonitis. DeLee, one of the modern teachers of obstetrics, has long been a staunch advocate of this operation. The disadvantages of the low cervical operation are that it is somewhat more difficult technically and requires ten to fifteen mintues more operating time than the classical operation. Such minor disadvantages for the trained obstetrician are in no sense commensurate with the many advantages and lowered mortality and morbidity of the low cervical operation.

INDICATIONS

The indications for cesarean section have been broadened as the technic and the safety of the operation have improved. Part of this change has been justifiable and advantageous with an increase in surgical skill and obstetrical knowledge. However, there has resulted, unfortunately, a radical and often disastrous attitude that cesarean section is now so safe that it may be undertaken by casual operators for the slightest of obstetrical difficulties, regardless of the training of the operator, the absence of a true obstetrical indication for operation, or the choice of the proper procedure indicated by the conditions present—all with disastrous or often fatal results for the patient. Titus[4] has shown conclusively that in those communities where this condition prevails, the highest maternal mortality rates in this country are to be found.

The greatest degree of safety is attained when the indications and the need for the operation have been recognized in advance of labor or in the earliest stages of labor. Reynolds[5] states that the morbidty and mortality following the classical cesarean section increase in direct proportion to the length of time the patient has been in labor prior to the operation. Williams[6] states that the mortality rises sharply following mere rupture of the membranes during that time.

As a general rule, the present day concept is to perform either a classical or low cervical type of section in these cases which are an elective procedure prior to the onset of labor or early in labor, and in whom potential infection is reduced to a minimum. Although the low cervical section is now more popular and has wider usage in modern obstetrical practice, the classical operation is still used in those cases in which sterilization is to be effected, or when speed in operating is of paramount importance. Those who perform the extraperitoneal type of operation, reserve them largely for a limited group of patients who are potentially or presumably infected as a result of prolonged labor and repeated examinations with doubtful technics or under adverse circumstances.

The Porro or radical type of cesarean section is at present reserved for those patients who are frankly infected at the time of operation, as shown by a history of repeated vaginal examinations, the presence of fever, rapid pulse rate, foul vaginal discharge and increased blood counts. On occasion, this type of operation is chosen for those cases of uncontrollable

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hemorrhage following cesarean section, particularly cases of placenta praevia, or cases of complicating uterine tumors in whom proper contraction of the uterus or control of hemorrhage at the time of operation cannot be maintained.

The indications for the performance of any type of cesarean section may be classified in several groups, including those of maternal origin, those of fetal origin, or combination of maternal and fetal, as well as those indications arising from some pre-existing or unexpected medical entity. For many years, medical students have been taught a more or less routine group of indications for cesarean sections, but the wider application of this operation with the present day knowledge and skill, has broadened the scope of indications greatly.

Absolute indication for cesarean section exists where delivery by any other method becomes impossible, such as extreme degrees of contracted or malformed pelvis, in gigantism of the infant, or in obstruction of the pelvic cavity by large tumors. All other indications are contingent upon the fetus being alive, mature or nearly so, and not deformed. In cases of uterine death of fetus or in the presence of a monstrosity as demonstrated by X-ray other methods of delivery may be chosen which carry less risk to the mother. Cesarean section is now warranted for many maternal and fetal indications, which formerly were considered insufficient reason in view of the attendant operative dangers.

Briefly, the following indications or combinations of indications may be presented as the most frequent causes for cesarean section:

I. Contracted pelvis or deformed pelvis;

II. Cephalo-pelvic or feto-pelvic disproportion;

III. Excessive size of fetus;

IV. Tumors blocking the pelvic cavity;

V. Placenta praevia;

VI. Premature separation of the placenta;

VII. Certain cases of toxemia of pregnancy, notably pre-eclampsia;

VIII. Malpresentation of the fetus, especially in small pelvis or large infants—

(a) Transverse (c) Brow
(b) Shoulder (d) Face

IX. Prolapse of the cord with living fetus;

X. Stenosis or atresia of the genital passages, either congenital or acquired;

XI. Medical disease of the mother—

(a) Heart Disease (c) Diabetes.
(b) Tuberculosis

Other conditions that may indicate cesarean section are encountered, and upon which judgment of the attending physician must be exercised. For example, multiparae with normal or slightly contracted pelvis, with a history of repeated difficult labors and deliveries resulting in stillborn babies, should be subjected to cesarean section in many cases. Primiparous patients who are nearing the normal age of the menopause and in whom any doubtful factor exists, such as a long firm cervix or mild pelvic contractions, and in whom the successful outcome of labor may be doubtful, should be considered as candidates for this operation. A combination of maternal with fetal indications is often a deciding factor in choosing delivery by abdominal section, as, for example, a breech presentation in an elderly primipara with rigid soft parts and a small pelvis.

The time-honored dictum of "once a cesarean, always a cesarean" does not hold true. The fact that a woman has had one cesarean section does not always necessitate a cesarean section in subsequent deliveries. Provided the original operation was performed for some reason, such as placenta praevia, which does not exist in the subsequent pregnancy, and provided the post-operative convalescence was afebrile and uncomplicated, then labor may be allowed to progress in this patient with a large degree of safety, provided there are no elements of disproportion existing. Such cases are common, I am sure, in the experiences of many obstetricians.

Repeated cesarean sections may be performed on those patients in whom a constant acceptable indication exists, such as a deformed or contracted pelvis. There is a wide divergence of opinion as to the number of cesarean sections any one patient may undergo. In my opinion, sterilization is justified and indicated after two or at the most three cesarean sections. Titus states that the greatest number of sections that he has performed on one patient is five. Phaneuf[7] reports two patients each of whom had six sections. Fletcher Shaw has reported seven on one patient, and D. J. McSweeney reported a ninth cesarean section on the same patient, according to Gordon and Rosenthal[8].

In discussing the indications for this operation, the following statements should be remembered:

Cesarean section is a surgical procedure of major

importance. It should not be undertaken by the occasional operator, or without the usual facilities of a well-equipped operating room and trained assistants. While it is true that it has been successfully done, and occasionally must still be done as an emergency measure in isolated rural areas without proper facilities, any such approach to a cesarean section is likely to add to the high mortality rate which already exists from this operation. Present day hospital facilities, improved transportation and conservative obstetrical care will usually permit these patients to be cared for in a well equipped hospital and under trained personnel, with a definite lowering of fetal and maternal mortality.

The attitude that any difficult labor may be ended successfully by a cesarean section, is not that of a well-trained obstetrician. The keenest obstetrical judgment is required to determine conservatively *when* and *why* to operate, *which type* of cesarean section to select to avoid disastrous results by preventing infection before and during operation, as well as hemorrhage following it.

One of the greatest factors in the high maternal mortality rate in this country is the injudicious and unwarranted abuse of cesarean section operation.

INCIDENCE

The incidence of cesarean section varies according to the type of patient, whether private or clinic, white, or colored. The incidence of sections varies from one to eight per cent in most large maternity hospitals in this country. Stander[3] reports that during the twenty-five years ending in 1930, the incidence of cesarean section in 13,339 deliveries at the Johns Hopkins Hospital was 1.7 per cent. He quotes Good as reporting 3.8 per cent incidence at the Boston City Hospital for the year 1929. Douglas[9] reports an incidence of 2.9 per cent at the University of Maryland in 3423 deliveries for the year 1947.

PRE-OPERATIVE CARE

The presence or absence of infection, either actual or potential, at the time a cesarean section is performed, is directly related to the maternal mortality from this operation. Vaginal examination before operation should be avoided entirely or reduced to an absolute minimum, being done only under rigid aseptic precautions in order to avoid contamination and infection. Deviations from this rule may result in fatal infections.

The general physical condition of the patient is of paramount importance. Patients in whom vomiting, excessive perspiration or limited fluid intake has occurred, should be given intravenous fluids prior to operation. All post-hemorrhagic cases, such as cases of placenta praevia or premature separation of the placenta, should be given blood transfusions of properly matched and known Rh blood prior to operation, and additional such blood should be available to administer during or immediately after operation. Those cases of prolonged labor, with questionable examinations and who are febrile, should be given penicillin in doses of 200,000 to 400,000 units prior to operation.

A cleansing enema should be given whenever possible in order to reduce post-operative abdominal distention as far as possible. The bladder should always be thoroughly drained and an open catheter left in the bladder until the operation is completed. Pre-operative medication consists of atropine alone, unless one prefers a basal analgesia by nembutal or other sedatives. Morphine, dilaudid, pantopon or other narcotics are definitely contraindicated, due to their depressing action upon the fetus.

ANESTHESIA

The subject of anesthesia for cesarean section has long been one of much debate and divergence of opinion among various authors. In general, the anesthesia of choice for most operators is some form of general inhalation anesthesia, especially nitrous oxide and oxygen or Cyclcpropane administered by a well trained anesthetist. Eastman has warned that combinations of nitrous oxide and oxygen in proportion of 85.15 produce some degree of fetal anoxemia and that a mixture of 90.10 over five minutes may produce profound fetal asphyxia.

Local anesthesia for cesarean section was strongly advocated by DeLee for many years. Beck[10] and Waters[11] among the present day authorities warmly advocate this anesthesia. A one per cent solution of novocaine, with or without adrenalin, is generally used. A highly satisfactory anesthetic is obtained by a preliminary infiltration with novocaine, followed by a very light inhalation of nitrous-oxide and oxygen until the child is delivered.

Today, spinal anesthesia has many advocates and many reports attest to its safety when properly administered in properly selected cases. As a rule 50-100 mgm. of novocaine is administered in the 2nd or 3rd lumbar interspace in 2 cc. of spinal fluid. Spinal anesthesia is contraindicated in post-hemorrhagic or

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shock cases, in cases of toxemia with marked hypertension, or in cases of hypotension. The administration of ephedrine subcutaneously following injection of the spinal anesthetic and giving of intravenous fluids during the operation will help to prevent post-anesthetic shock. Post-operative pain and distention, inability to void, nausea and vomiting and respiratory complications are all reduced following spinal anesthesia, as compared to inhalation anesthesia. Cosgrove[12] has had an extensive and favorable experience with its use in obstetrics, and Thomas also endorses its use. Contraindications must be followed and the anesthetic given by, and followed by well trained personnel.

POST-OPERATIVE CARE

All cesarean section cases should be closely watched for the first 1-2 hours following operation, in order to detect the presence of hemorrhage or shock. Hemorrhage may occur from the uterus following either the classical or low cervical operation, especially in cases of placenta praevia or abruptio placenta. Administration of pituitrin or ergotrate is often needed, with manual massage of the uterus and in some instances post-operative uterine packing is necessitated. Plasma or whole blood in sufficient amounts must be given immediately to replace blood loss from the operation, to prevent shock, which may become irreversible if severe.

Liberal use of narcotics for relief of pain is desirable the first 48 hours. Morphine, codeine, dilaudid or demerol should be given freely. The urinary bladder should be emptied at frequent intervals or an indwelling catheter left in the bladder. Every attempt should be made to prevent a post-operation urinary tract infection.

Intravenous glucose solution should be given on return of the patient to her room. A 10 to 25% solution is routinely administered by Titus to all post-operative cases, and he cites the following well established rationale: (1) tone is improved so that shock and intestinal atony are thereby combated, (2) thirst is allayed and fluid intake provided, (3) the liver's detoxication action is reduced by the dextrose, (4) post-operative intoxication acidosis and nausea and vomiting are usually avoided, and (5) peristaltic activity of the bowel is restored earlier.

The usual post-operative care of the bowels, the diet, wound care and early ambulation, are all essentially the same as following any major gynecologic operation.

PROGNOSIS

The results of cesarean section vary greatly, depending upon several factors, namely: the experience and judgment of the operator, the type of operation done, the presence or absence of infection, the presence or absence of shock of the patient, the general hospital or operative facilities, and the time in labor that the operation is performed.

Holland's[13] studies have been widely quoted since they include figures from many different operators. He found in a series of 1,953 sections, a maternal mortality of 1.6 per cent in those done before labor as an elective procedure; 1.8 per cent early in labor; 10 per cent late in labor, 14 per cent after induction of labor and 27 per cent after attempts at delivery by forceps.

Courties and Fisher[14] reported 1000 cesarean sections. From 1911 to 1919, the maternal mortality in 204 sections was 10.2 per cent. During the next period 1920-1931 the mortality was reduced to 6.4 per cent. A series of 376 low cervical sections showed mortality rate of only 1.3 per cent. Morbidity was also markedly reduced in this type of operation, as compared to the classical section.

According to Irving[15] the gross mortality in this country between 1931 and 1936 was established to be 5.8 per cent by 17 authors. The present mortality in the better clinics now ranges from 1.5 to 4.5 per cent, this reduction resulting from better training and conservative judgment, the more wide-spread use of the antibiotics and sulfonamides, better hospital facilities, improved methods of blood transfusion, and the gradual replacement of the classical operation by the low cervical section. However, Titus re-emphasizes the fact that the general mortality throughout the country is considerably higher than this, and he concludes that the answer to this is the obvious and logical combination of poor obstetrical judgment and poor surgical ability.

CASE REPORTS

In a series of one thousand consecutive private deliveries, there were 41 cesarean sections performed, an incidence of 4.1 per cent. The following case reports from this series are presented briefly to illustrate a variety of indications for cesarean section, as well as certain complications which may arise:

Case I:

Mrs. R. S. H. is a white primipara, age 41, whose E.D.C. was November 2, 1946. Past history is im-

portant in that patient has been excessively obese and over-weight since puberty. Average weight has varied between 310-340 pounds. Patient had a thrombo-phlebitis of the right leg following an auto accident in 1943. Present pregnancy has been essentially normal until admission on November 29, 1946, with a blood pressure of 150/100. Under usual treatment for toxemia of pregnancy, condition improved and labor was induced on December 2, 1946. Moderately severe labor pains continued during the day and night and on the following day, after 36 hours of labor, the cervix was only 5-6 cm. dilated and the fetal head unengaged. A low cervical cesarean section was then done under nitrous-oxide and oxygen anesthesia and a large living male infant, weighing 13 pounds 8 ounces, was delivered in good condition. The post-operative course was essentially normal, the temperature rising to 100.2 on the second post-operative day and to 99.3 on the third post-operative day. The operative incision healed per primum and the patient was discharged on December 16, 1946, on the 13th post-operative day in good condition.

Diagnosis:

1. Excessive obesity
2. Elderly primipara
3. Feto-pelvic disproportion with excessive size of child
4. Test of labor with failure of engagement of fetal head.

Comments: This patient was the largest I've ever delivered and the child the largest I've ever seen or delivered. Failure of engagement of the head with normal progress of labor and the excessive size of the child precluded the possibility of a successful outcome of vaginal delivery and necessitated a cesarean section in the interest of both mother and child. Elective cesarean section in a 41 year old primipara may have been the desired approach to this case, but the large size of the maternal pelvis indicated at least a trial of labor.

Case II:

Mrs. L.O.P. is a white primipara, age 21, whose E.D.C. was March 1, 1947. She was admitted to the Lynchburg General Hospital on January 30, at eight months pregnancy because of a rapidly developing pre-eclamptic toxemia with headache, scotomata, edema and heavy albuminuria, in spite of the usual preventive treatment initiated two weeks prior to admission. In spite of vigorous toxemia treatment, including heavy sedation, hypertonic glucose, concentrated magnesium sulfate, the blood pressure rose to 200/115. The fetal head was unengaged, the cervix was long and closed. In view of this fulminating pre-eclampsia with impending convulsions, a low cervical cesarean section was done on February 2, 1947, forty-eight hours after hospital admission. Anesthesia consisted of 1% novocaine infiltration followed by nitrous-oxide anesthesia as uterus was opened. A living child was delivered in good condition. The post-operative course was normal, except for a rise of temperature to 100.3 on the first, second, and third post-operative days, following which it remained normal. The operative incision healed without drainage or infection and the patient was discharged in the 10th post-operative day, at which time the blood pressure was 132/96, the urine free of albumin and kidney function normal.

Diagnosis:

1. Pregnancy 8 months
2. Fulminating pre-eclamptic toxemia
3. Rigid cervix with unengaged fetal head.

Comment: The rapid development of a severe toxemia with impending eclampsis in a primipara at eight months, and a rigid, non-dilated cervix, necessitated cesarean section in this patient. The strain of labor or additional delay would have undoubtedly resulted in eclamptic convulsions. On follow-up, this patient continued to show a mild elevation of the blood pressure around 135/88 for one year postpartum. In spite of contraceptive measures, patient again became pregnant in 1948 and was delivered again in December by elective cesarean section near term, as the hypertension again increased with development of a moderate degree of pre-eclampsia. Sterilization was advised and carried out and the post-operative course was uncomplicated.

Case III:

Mrs. R.T.G. is a white primipara, age 20, whose E.D.C. was April 20, 1948. Pregnancy had been normal and uncomplicated. Past history is of no significance. Labor began spontaneously on April 12, 1948, and, on admission, labor pains were occurring every five minutes; the cervix was well effaced and dilated 3 cm. with fetal head presenting. Membranes were ruptured artificially at 9:20 A.M. to stimulate labor and labor progressed normally except that patient was extremely restless under analgesia,

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trying to get out of bed. At 1:30 P. M. when meconium appeared in amniotic fluid and the fetal heart tones suddenly became slower and of irregular rhythm, sterile vaginal examination revealed a large loop of prolapsed umbilical cord in the upper vaginal canal and the cervix dilated 5 cm.

Immediate preparations were made for operation and at 3:15 P.M. a living female child in fair condition was delivered by low cervical cesarean section under nitrous-oxide oxygen anesthesia. The baby's condition improved rapidly and the patient's post-operative condition was excellent.

Penicillin therapy was started the day of operation and continued for three days. The post-operative course was uncomplicated, except for fever of 100 degrees on the first, second, third, and on the eighth and tenth post-operative days. The operative incision healed per primum. No evidence of incisional, renal, pulmonary or venous infection was found and the patient was discharged on the thirteenth post-operative day in good condition.

Diagnosis:

1. Prolapse of umbilical cord, intrapartum
2. Pregnancy, term with spontaneous labor.

Comment: Prolapse of the umbilical cord represents an acute obstetrical emergency, the treatment of which is usually unsuccessful, and the fetal mortality rate is extremely high. Immediate cesarean section is the treatment of choice if time and the baby's condition will permit. The restlessness of this patient is felt to be the direct cause of this complication, well after labor was in progress. Penicillin therapy was administered in view of the pre-operative examinations required. Prolapse of the umbilical cord occurs more frequently in abnormal presentations, such as breech, transverse, shoulder, or face, and more frequently prior to onset of labor. Nitrous oxide oxygen anesthesia was used as a means of saving time, every minute of which was vital to saving this child.

Case IV:

Mrs. E. A. P. is a white multipara, age 33, whose E.D.C. was April 13, 1948. The past history is significant in that this patient had five previous pregnancies—two pregnancies resulting in spontaneous miscarriages, one full term still-birth resulting from a prolapsed cord in a breech delivery, and two living full term babies. In 1945, a cholecystectomy and appendectomy were performed.

The present pregnancy was complicated by nausea and vomiting of early pregnancy, secondary anemia, hypothyroidism, acute sinusitis, excessive Braxton-Hicks contractions, and one episode of slight vaginal bleeding at the eighth month. Large varicose veins of the legs and vulva were a constant source of additional discomfort. In view of this clinical picture and the past obstetrical history, post-partum sterilization was advised.

On April 13, 1948, examination revealed the child in a direct transverse position with the placental souffle distinctly heard in the lower uterine segment. In view of this complication, which could not be corrected by external version, the patient was admitted to the hospital for elective cesarean section in view of a placenta praevia and the impossibility of a normal vaginal delivery. Hemorrhage from the lower uterine segment was definitely feared.

On April 17, 1948, a low classical cesarean section was done under spinal anesthesia, avoiding as well as possible, the extensive and large venous sinuses in the lower uterine segment. A normal female infant in good condition was delivered and the placenta was occupying the entire lower uterine segment, completely covering the cervical canal. On delivery of the placenta, there was profuse bleeding from the entire placental site, which was difficult to control by massage, insertion of hot packs, and administration of ergotrate and pitocin. The uterus was then tightly packed with four yards of gauze packing and the hemorrhage appeared controlled. Both uterus tubes were ligated and the abdomen closed in the usual manner. At the completion of the operation, blood pressure was 98/60, pulse of fair volume and 1000 cc. 5% glucose was given intravenously.

Shortly after return to her room, signs of shock appeared and blood pressure dropped to 60/40. The pulse became weak and peripheral circulation collapsed. 500 cc. citrated blood, 100 cc. blood plasma given immediately but condition became critical because of extreme shock. Vaginal bleeding through packing appeared and additional vaginal packing was of no avail. For nine hours, condition was very critical and continuous oxygen was administered. During this period, sixteen pints of whole blood were given after surgical exposure of both femoral and antecubital veins. Profound shock continued and bleeding could not be controlled. At 10:30 P.M., as a life-saving measure, a supra-vaginal hysterectomy was done, during which procedure 2000 cc. of

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whole blood was given. The patient's condition gradually improved, signs of shock disappeared and two additional transfusions were given until hemoglobin was 80% on the 9th post-operative day. The temperature reached 102 on the first post-operative day, 103 on the second day, and 100 degrees on the third day. The post-operative course was then smooth and uncomplicated, the operative incision healed without infection, as well as those of the arms and groins, and the patient was discharged on the 15th post-operative day in good condition.

Diagnosis:

1. Placenta praevia, centralis
2. Transverse presentation
3. Extensive varicose veins of legs and vulva
4. Secondary anemia, acute, severe from acute blood loss.

Comments: This case represents a multiplicity of indications and complications. Avoiding operative delivery was deeply desired due to extensive venous involvement, but the complicating placenta praevia and transverse presentation necessitated such procedure. The shock was the most profound ever seen to recover. The fact that this patient was a type II, Rh positive, was vital in her recovery, since 32 donors were available and matched in a short time. Hysterectomy was decided upon as a last resort in spite of profound shock, since hemorrhage could not be controlled in any other manner. Complete and cheerful cooperation and perseverance of six consultants, the laboratory, nursing and operative staffs must be credited with saving this patient's life.

Case V:

Mrs. C.M.L., a R.N., white multipara, gravidarum II, age 35, whose E.D.C. was August 17, 1948. Pregnancy was uncomplicated, except for a tendency to constant Braxton-Hicks contractions during last four months, requiring administration of corpus luteum hormone.

Past history was essentially negative, except for the obstetrical history. At the time of patient's first pregnancy in 1941, examination revealed the presence of a double cervix and bicornate uterus. The two distinct cervices were quite small and separated by a thick band of fibrous tissue. Because of this finding the first pregnancy was terminated at term by an elective cesarean section, since it was felt that normal delivery by the vaginal route could not be anticipated.

On August 12, 1947, a repeat cesarean section was performed under spinal anesthesia and a living male child delivered in good condition. Examination showed the uterus to be completely divided into two separate cavities by a septum extending from the fundus to the cervix, this being a double uterus, rather than a bicornate type. In view of this congenital anomaly and the second cesarean section, sterilization was done by ligation of both uterine tubes, this having been discussed with the patient and husband prior to operation.

The post-partum course was normal and afebrile except for a rise of temperature to 101 degrees on the first post-operative day. The incision healed per primum and patient was discharged on the twelfth post-operative day in good condition.

Diagnosis:

1. Congenital deformity of uterus consisting of double uterus and cervix
2. Repeat cesarean section with sterilization.

Comments: There was a constant and permanent indication for abdominal delivery in this patient due to the congenital anomaly of the uterus resulting in atresia of the birth canal, and sterilization was felt justified after the second operation.

Case VI:

Mrs. W.G.M., a white multipara, gravidarum II, age 27. The E.D.C. was September 4, 1947, and her pregnancy had been entirely normal until August 21, 1947, at which time patient had a moderately severe painless vaginal hemorrhage at home and was admitted to the hospital for observation and treatment. All bleeding ceased, and the patient's general condition was good, and with selected donors matched and typed and on call, the patient was allowed to return home. Her condition remained normal until the night of September 1, at which time a second mission, painless vaginal hemorrhage occurred at home during sleep. Patient was immediately admitted *via* ambulance and prepared for cesarean section and blood was drawn from three donors. One unit of blood plasma was administered while patient was prepared for operation and a whole blood transfusion started in the operating room prior to operation.

Under light nitrous-oxide oxygen anesthesia, a midline incision was made as rapidly as possible and the uterus opened by low cervical cesarean section incision. On opening the uterus, the placenta was encountered in the entire lower uterine segment and

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completely covered the cervical canal. Bleeding from the large venous sinuses in the lower non-contractible portion of the uterus was severe. The placenta was delivered first, followed by the delivery of a living male infant in very good condition. All visible sinuses were clamped, the uterus massaged briskly and tightly packed with large hot gauze packs. Ergotrate was given intramuscularly and 1 cc. of pitocin was injected into the uterine wall. However, bleeding was uncontrollable and the patient was rapidly approaching the stage of shock, with rapid pulse, and a sharp drop in blood pressure. In view of this condition, it was felt that the only method for control of the severe hemorrhage was by supravaginal hysterectomy, which was carried out in the usual method as rapidly as possible, with plication of the round and broad ligaments to the cervical stump and peritonealization by the bladder flap of the peritoneum. The abdomen was closed in the usual manner without drainage and the patient given a second transfusion on return to her room. Her condition improved rapidly following the second blood transfusion and all signs of shock disappeared.

On the second post-operative day temperature rose to 103 degrees followed by a chill of moderate severity, which was felt to be due to a delayed transfusion reaction. The following day the temperature again rose to 101.2, but remained normal thereafter. The hemoglobin was 62% at this time in spite of the previous two blood transfusions, and a third transfusion was given on the 7th post-operative day.

The post-partum course was otherwise afebrile and uncomplicated, the operative incision healed per primum and the patient was discharged on the fifteenth post-operative day in good condition.

Diagnosis:

1. Placenta praevia centralis
2. Post-operative uterine atonia with acute hemorrhage and shock
3. Cesarean hysterectomy for uncontrollable hemorhhage.

Comments: Hysterectomy was necessitated as a life saving procedure in this case. Ordinary procedures to control hemorrhage were ineffectual. Preoperative preparations for available whole blood and the administration during the operation, probably prevented the development of fatal shock.

Case VII:

E.L., a colored primipara, age 35, whose E.D.C. was June 20, 1947. Past history is significant in that patient had a luetic infection some years ago with adequate treatment, but Wassermann remained positive in spite of continued treatment.

The prenatal course was uncomplicated and the patient was admitted to the Lynchburg General Hospital at 7:00 P.M. on June 19, 1947, following spontaneous rupture of membranes and onset of labor pains. Presentation was L.S.A. with the breech unengaged. Paraldehyde analgesia was administered and active labor pains continued throughout the night and the following day without progress. At 2:00 P.M. a sterile vaginal examination revealed a dilation of the cervix of about 3 cm., with the breech still un-engaged, and lying in the left iliac fossa. Under 100 mgm. of novocaine in the third lumbar interspace, a low cervical cesarean section was done and a living female child in good condition was delivered. The post-operative course was uneventful. The temperature was 99.2 on the first post-operative day, and 99.3 on the second post-operative day, following which it remained normal. The operative incision healed without infection and the patient was discharged on the twelfth post-operative day in good condition.

Diagnosis:

1. Pregnancy term in elderly primipara
2. Cervical dystocia with failure of engagement
3. Breech presentation.

Comments: This case presents a typical example of an indication which at times necessitates operative interference. Had the breech engaged and normal progress of labor ensued, then delivery per vaginum would have been the procedure of choice. Breech presentation in elderly primiparas often results in a dystocia which requires cesarean section for successful termination of labor.

Case VIII:

Mrs. W. W. C., Jr., was a white primipara, age 27, whose E.D.C. was July 22, 1947. The past history was significant in that the patient received a fracture of the pelvis in an automobile accident in 1944. The prenatal course was normal throughout. X-ray pelvimetry on July 1, 1947, revealed a marked asymmetry of the pelvic inlet with marked shortening of the right oblique diameter and a narrowing of the fore-pelvis.

In view of this permanent pelvic deformity, normal labor at full term was impossible and elective cesarean section near term was advised. On July 21, 1947, a low cervical cesarean section was done

under 100 mgm. of novocaine intraspinally and a living female child in good condition was delivered. The post-operative course was normal and afebrile, the operative incision healed without infection, and the patient was discharged on the twelfth post-operative day in good condition.

Diagnosis:

1. Post-traumatic pelvic deformity with obliquely contracted pelvis
2. Cephalo-pelvic disproportion

Comment: As in this case, all cases presenting a history of pelvic fracture should have an X-ray taken before the onset of labor, regardless of the external measurements obtained. In some cases, the pelvic inlet deformity is minimal or neglible and normal labor may ensue. However, rather marked degrees of contractions may be present, without external evidence of deformity. Elective cesarean section before labor is always desirable in those cases requiring operative delivery.

Case IX:

Mrs. W. H. R. was a primipara, age 25, whose E.D.C. was October 16, 1948. The prenatal course had been normal and uncomplicated. Patient was admitted to hospital on October 9, 1948, one week prior to term, following spontaneous rupture of membranes and the onset of mild uterine contractions. Contractions ceased entirely after admission, but abdominal examination revealed an unusual presentation and position. Abdominal X-ray was taken and showed an unusual compound presentation of the mid-dorsal spine of the fetus with a prolapsed hand, the fetal head and breech occupying the uterine fundus, the uterus being tight and amniotic fluid gone, version could not be done.

A low cervical cesarean section was done under 100 mgm. of novocaine intraspinally and a living female infant delivered with great difficulty due to the position in the uterus.

On the first post-operative day, the temperature rose to 102 degrees and penicillin therapy was begun. The temperature remained normal until the sixth post-operative day when fever of 100 appeared. The following day, the operative incision was dressed and the skin sutures removed, and a large subcutaneous abscess was opened which contained a large amount of thick, foul smelling pus. Wound irrigation and drainage was initiated and trisulfanyl and streptomycin administered. Smear from the wound showed gram positive cocci, and both gram positive and gram negative bacilli. Culture of the pus showed gram streptococci, but the gram negative organism did not grow. The temperature remained normal, and the incision gradually ceased draining under daily irrigation. The patient was discharged on the twentieth post-operative day in good condition.

Diagnosis:

1. Pregnancy term, compound presentation
2. Post-operative wound infection.

Comment: A similar presentation of the fetus had never been encountered by the author. Premature rupture of the membranes often precedes an abnormal presentation, but this occurrence also prevents satisfactory or successful external version. The etiology of the massive wound infection is not known, since this patient was not considered even a potential infection, no examinations having been made prior to operation.

(Note: On post-partum examination at six weeks, the pelvis was clear, except for moderate sub-involution of the uterus. One month later, the patient felt a painless mass in the right lower quadrant and presented a normal temperature and blood count. However, after surgical consultation, a laparotomy was done and a large abscess involving a ruptured appendix and the right ovary was encountered.)

Case X:

Mrs. R.C.S. was a primipara, age 42, whose E.D.C. was July 5, 1948. The past history was of no significance. The present pregnancy was complicated by the presence of uterine fibromyomata, which at times produced some pain and tenderness. The patient was admitted to the hospital on June 29, one week prior to full term, for pre-operative preparation, including blood matching and vaginal preparation, since elective cesarean section was chosen in view of this patient's age, the complicating fibroid tumors, and the uncertainty of vaginal delivery.

On July 2, 1948, a low cervical cesarean section was done under 100 mgm. of novocaine intraspinally and a living female infant was delivered in good condition. The uterus contracted firmly with minimal blood loss and no attempt at multiple myomectomy was made. The post-operative course was normal and uncomplicated, the temperature rising to 100 degrees on the second post-operative day, and remaining normal thereafter. The operative incision healed without infection and the patient was discharged on the twelfth post-operative day in good condition.

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Diagnosis:

1. Pregnancy term, elderly primipara
2. Fibromyomata of uterus

Comments: In view of the patient's age, the presence of uterine tumors and the uncertainty of future pregnancies with the above factors, elective cesarean section was chosen. The tumors being superficial, myomectomy was not done, with the possibility of tumor involution. Post-operative examination since delivery has substantiated this hope, in that the uterus at present is of normal size and consistency with only one small subserous nodule palpable.

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Allied Arts Building.

New Books.

We list below names of some of the newer books at the Tompkins-McCaw Library of the Medical College of Virginia. These may be borrowed under usual library rules by writing the Library.

A.R.N.M.D.—Psychiatric treatment. Vol. 31, 1953.
Alexander—Operating room technique. 2d ed., 1949.
Alexander—Treatment of mental disorder. 1953.
Dameshek & Welch—Hypersplenism and surgery of the spleen. 2d ed., 1950.
Davis—Principles of neurological surgery. 4th ed., 1953.
Dollard & Miller—Personality and psychotherapy. 1950.
Gellhorn—Physiological foundations of neurology and psychiatry. 1953.
Goldberger—Heart disease: its diagnosis and treatment. 1951.
Graybiel—Electrocardiography in practice. 3d ed., 1952.
Hardy—Pain sensations and reactions. 1952.
Herbut—Gynecological and obstetrical pathology. 1953.
Joslin—Diabetic manual. 9th ed., 1953.
Nicolson—Clinical electrocardiography in children. 1953.
Pitkin—Conduction anesthesia. 2d ed., 1953.
Raffel—Immunity, hypersensitivity, serology. 1953.
St. Mary's Hospital—Operating room technic. 4th ed., 1953.
Thatcher—History of anesthesia. 1953.
Todd—Clinical diagnosis by laboratory method. 12th ed., 1953.

New Booklet for All AMA Members.

How the AMA may serve you . . . as one of its members . . . is the theme of a new pamphlet which the American Medical Association will publish this summer. Designed to acquaint members with the AMA's many activities and services, "It's Your AMA" will be mailed to every member, and, thereafter, will be sent to each new member of the Association.

SOME ROENTGENOLOGICAL ASPECTS OF PEPTIC ULCER*

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Peptic ulcer is discussed and written about as much probably as any condition encountered in medicine. In addition to all you hear and read about this subject, many of you have a personal knowledge of the disease since there is a considerable minority here present who have had proven peptic ulcers. However, if one must have some physical defect, a peptic ulcer probably is about the best one to have for several reasons. In the first place, it affords some protection against gastric carcinoma. In the second place, if one takes care of his ulcer he will incidentally take care of himself generally and in many cases will live longer because of his ulcer than he would have without it. Thirdly, it is agreed by many authorities that a person with a peptic ulcer does a better job than one of the same apparent caliber and capabilities who does not have the ulcer. Someone has stated that having an ulcer will not prevent one's being a bum but it will make him a better bum.

Peptic ulcer may be defined as an erosion of one or more of the layers of the gastro-intestinal tract occurring in locations exposed to the acid gastric juice. This definition is not 100% correct because of the fact that a few cases of peptic ulcer have been reported in individuals in whom there was a total absence of acid, but, by and large, it may be accepted.

Ulcers may occur in the esophagus. This, however, is an unusual site of peptic ulcer, the incidence being about 0.13% as found in a large number of autopsies. Gastric and duodenal ulcer are relatively common, and duodenal ulcer is about four times as common as gastric ulcer from a surgical and radiographic standpoint, but this is not true actually, as demonstrated by the fact that in a large number of autopsies there was evidence found in the stomach of healed or active ulcers in 1.5% of the cases examined. Healed or active duodenal ulcer was

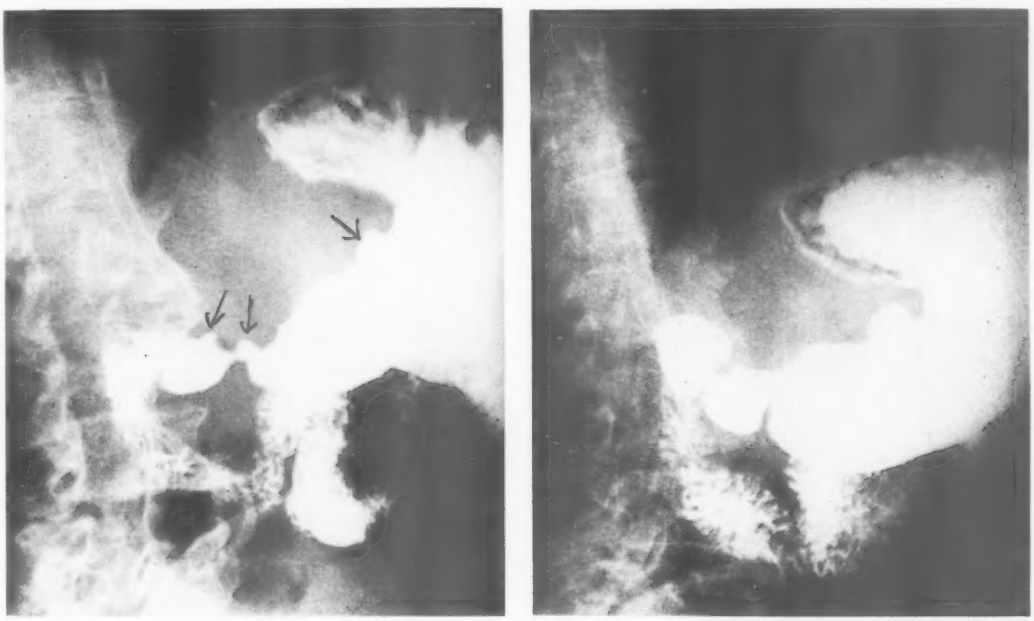

Fig. 1 a and b. Three peptic ulcers in one individual—one in the upper part of the stomach, the second along the lesser curvature side of the pylorus, and the third along the upper surface of the duodenal bulb. The two lower ulcers apparently were healed in two weeks. The larger gastic ulcer became larger in the two weeks, suggesting that this might be malignant; however, it proved to be benign at operation.

*From the Department of Roentgenology, and presented at a Staff Conference of the Winchester Memorial Hospital, Winchester, Va., February 20, 1952.

found in only 0.5% of the cases examined. As you see, gastric ulcer is about three times as common as duodenal ulcer but apparently many ulcers of the stomach are acute and heal in a short time so that clinical diagnosis is never made, while the duodenal ulcers are more chronic. It is unusual to have a peptic ulcer beyond the first portion of the duodenum unless some operative procedure has been carried out. There are occasional ulcers in the second portion of the duodenum where, however, no surgery has been done. Where a gastro-enterostomy has been done, marginal ulcers may occur, but I have no statistics for this location.

Fig. 2. Ulcerating malignancy in a large diaphragmatic hernia, not proven.

Next to what is learned from the patient's history, I believe that it is generally agreed that the Roentgenographic examination is the most important procedure in diagnosing and following the course of a peptic ulcer. In most cases the Roentgenologist should be able to make a diagnosis of peptic ulcer where one exists, and he should be able to give its location, and this becomes very important in profuse bleeding of an ulcer, where surgical intervention is necessary. This is difficult in some cases, and where more than one ulcer crater is seen, it is impossible for the Roentgenologist to state which one is bleeding.

Probably the most important job of the Roentgenologist in connection with an ulcer of the gastro-intestinal tract is to differentiate the benign from the malignant ulcer, and this he cannot do with certainty in any case except by repeated examinations and then

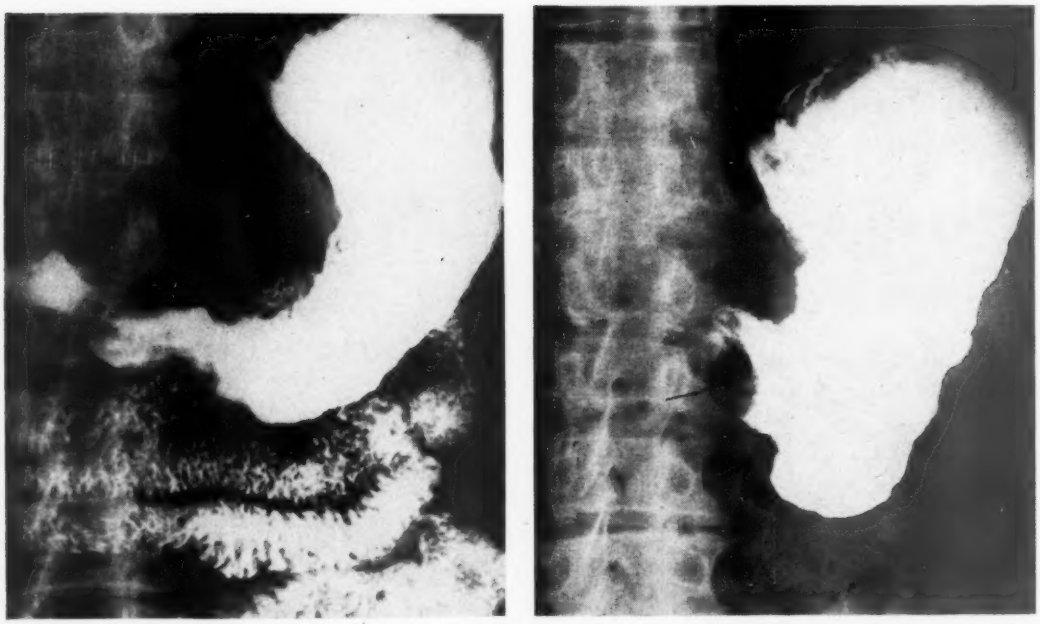

Fig. 3 a and b. What was thought to be a benign ulcer in the pre-pyloric region, and one which improved over a period of about six weeks, and then in about six months proved to be carcinoma.

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he will be wrong in some cases. It has been stated that a dogmatic Roentgenologist can do a great deal of harm in regard to lesions of the gastro-intestinal tract, and this undoubtedly is true. However, I do not believe that any Roentgenologist could remain dogmatic for very long in this locality, due to the fact that we have so many dis-believers, and in these conditions, dis-belief becomes a virtue.

Fig. 4. Large gastic ulcer proven at operation to be benign. The ulcer had perforated and was walled off.

Some of the differential points roentgenologically between benign and malignant ulcers are as follows: (1) A small crater is more apt to be benign than a large one. However, an ulcer may cover most of the gastric wall and still be benign, and a very small crater occasionally is malignant. (2) In a malignant ulcer, the wall about the crater usually has become infiltrated and peristalsis does not pass through this region normally, while in the benign ulcer there is practically no alteration in peristalsis. (3) In malignancies the mucous membrane about the crater is usually destroyed or its arrangement is disturbed. In a benign ulcer the mucous membrane is normal up to the edge of the crater. (4) In malignancy the crater usually extends into a filling defect in the stomach and not beyond the point where the normal stomach wall should be. In benign ulcers the crater extends through a portion or all of the wall in its normal position. (5) The location of the crater may be helpful in a differential diagnosis since most ulcers along the greater curvature side of the stomach are malignant, especially as one approaches the

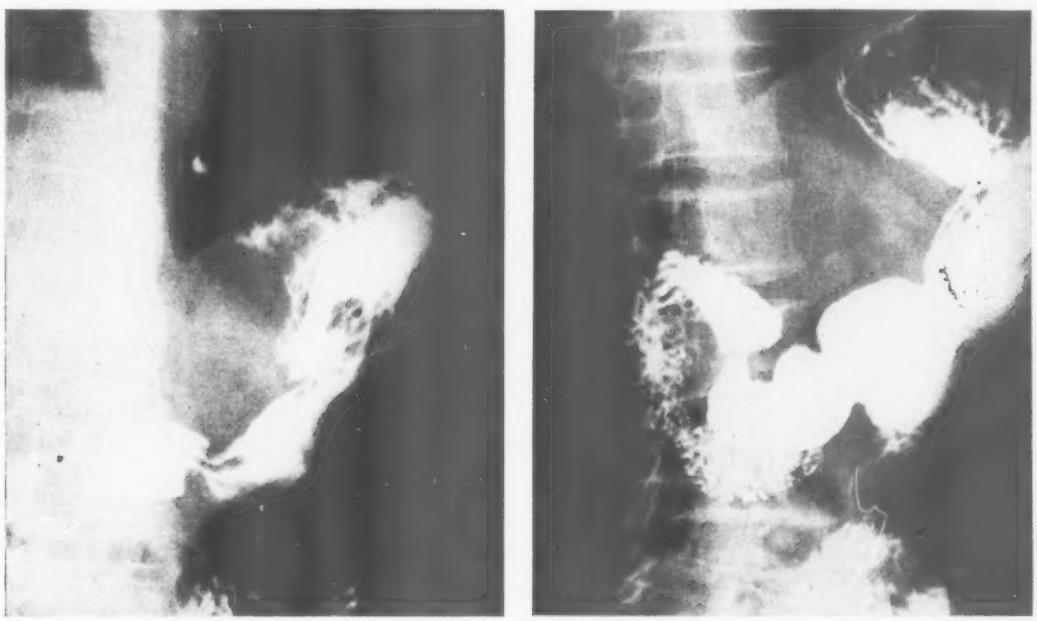

Fig. 5 a and b. A diagnosis of carcinoma was made without much reservation. Eight months later the lesion had disappeared.

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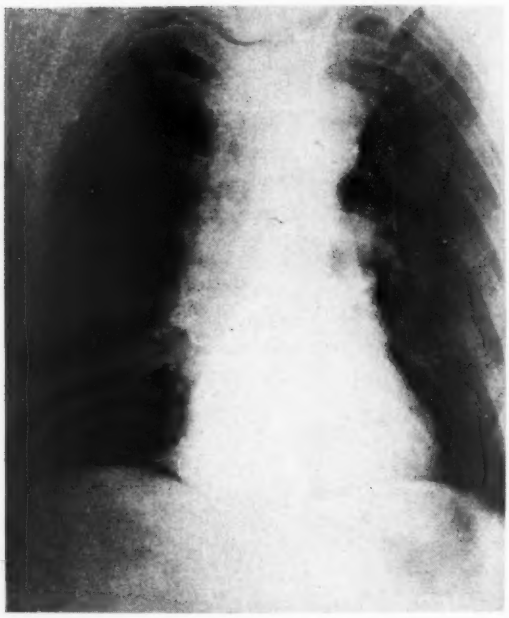

Fig. 6. An up-right film of the chest showed free gas in the peritoneal space and the diagnosis of perforation of a hollow viscus was suggested. The patient was treated by the Horgan method with immediate and dramatic results. Eight days later the patient was given barium and a duodenal ulcer was proven.

pylorus. Ulcers of the lesser curvature side of the stomach are more apt to be benign, but either type can occur at any location in the stomach. (6) Where there is a gastric and a duodenal ulcer, the gastric ulcer is very likely to be benign, but there have been cases of carcinoma of the stomach in conjunction with a benign duodenal ulcer. (7) If the ulcer is in the duodenum, one can be practically sure that it is benign, and, so far as I know, no benign ulcer of the duodenum has ever become malignant. A small percentage of benign gastric ulcers are believed to become malignant, but there is doubt in some very capable minds about this ever occurring.

All gastric ulcers should be carefully followed roentgenographically and if the crater disappears within a relatively short time, from two to six weeks, the chances are that the lesion is a benign one. However, there have been cases where the crater disappeared entirely in a very short time, and later proved to be malignant. This can occur when the ulcer crater becomes filled with tumor cells or blood, or when so much edema develops about the ulcer that the opening from the lumen of the stomach or intestine becomes closed and no barium can be seen to enter the crater. In almost all malignant ulcers the appearance is very apt to improve somewhat on a strict

Fig. 7. Diverticulum of the stomach, not proven but having a typical appearance of diverticulum and no symptoms suggestive of gastric ulcer.

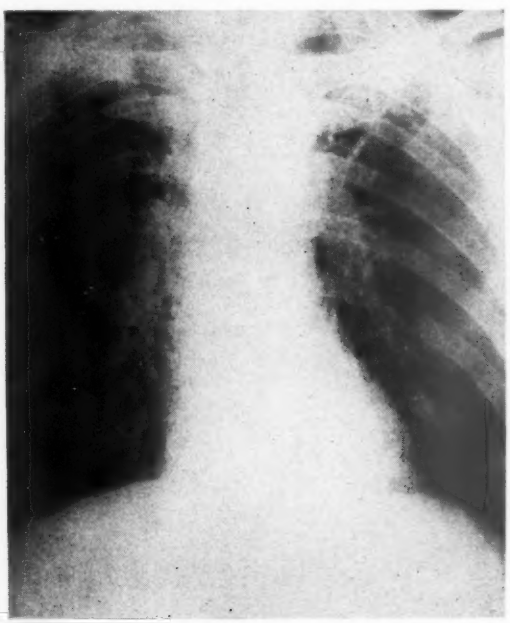

Fig. 8. Patient sent for gastro-intestinal examination and far-advanced bilateral pulmonary tuberculosis was found with no evidence of peptic ulcer.

ulcer regime, but it is unusual for the crater to disappear entirely. On the other hand, there are some benign ulcer craters that change very little or become larger even when a very strict regime is followed.

As you can see from the above statements, it is never possible roentgenologically to rule out absolutely the possibility of a malignancy in any ulcer.

Since one of the gentlemen to follow me in this discussion is a surgeon, and anticipating that the roentgenological examination of the gastro-intestinal tract may be pushed around a bit, I cannot refrain from making the following statement. I have seen surgeons hold the stomach in their hands and look directly upon an ulcer crater and be unable to tell whether or not the ulcer was benign or malignant. Therefore, I make no apologies for the roentgenological examination of the gastro-intestinal tract.

The films illustrate some of the points about which we have been talking.

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Buckstein: The Digestive Tract in Roentgenology. Published by J. B. Lippincott Company. 1948.

PR Institute Set for September.

Outstanding postgraduate courses in medical public relations will be offered at the AMA's second Public Relations Institute for all state and county PR personnel. "Classes" will convene September 2 and 3 at Chicago's Drake Hotel.

Topics such as medical forums presented by medical societies in cooperation with local newspapers and tips on how to conduct successful public relations programs on limited budgets will be discussed by authorities in the field. In addition, emphasis will be placed on the use of television as a PR medium. Specially-filmed shows available for use by local medical societies will be given a preview at the Institute.

Designed primarily for lay public relations employees of state and county medical societies, the program will include both talks by PR experts and bull-sessions to give each registrant a chance to solve his special local problems.

AMA Transcriptions Feature Healthy Summer Fun.

Everyday health problems facing the average American family during the summer months form the basis of a new series of radio transcriptions to be released in July by the Bureau of Health Education. The 13-program series, "June, July and August," dramatizes the adventures of the typical Holloway family and their friends . . . on the farm, in the woods, at the beach. With Ralph Camargo as host, the dramatic presentations are followed by discussions of summer health problems by W. W. Bauer, M.D., Bureau director. Subjects include: Poison Oak and Ivy; Water Safety; Highway Safety; Sun and Sorrow; Hay Fever; Summer Insects; High Powered Vacation; Baby Health; Summer Eating; Keep Cool; Farm Hazards; Air Conditioning, and Summer Clothing. The series is available on loan to local medical societies through the Bureau.

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ETIOLOGY AND TREATMENT OF PEPTIC ULCER: A REVIEW*

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Medically as contrasted to surgically, a review of this subject entails consideration of etiologic and therapeutic factors, and these two main divisions of the subject shall be reviewed here.

Chronic and recurrent dyspeptic symptoms are common. The most frequent organic cause of such symptoms is peptic ulcer. Statistically 10% of all adult males have an ulcer at some time in their lives.

An ulcer appears because there is devitalization of a small circumscribed area of the gastric or duodenal wall which, coupled with the presence of acid and pepsin, sometimes produces ulcer. It is known also that devitalization may occur without chronic ulcer formation and acid and pepsin may be present and no ulcer formed.[1]

Interdependence of a host of factors in the pathogenesis of chronic ulcer is so great and the factors so difficult to analyze that various classifications of ulcer on bases such as neurogenic, chemical, infectious, nutritional and traumatic, is not believed justified. It seems best to isolate the factors and consider individually what is known about each without attempting a clearcut, rigid hypothesis that inevitably results in peptic ulceration.

Intragastric Factors: A great deal of work has been done on the acid and pepsin producing power of the stomach in relation to formation of a peptic ulcer. With few exceptions the dictum applies "no acid—no ulcer". Areas of intestine not in contact with acid-pepsin do not develop ulcer, and pernicious anemia patients do not have ulcer.

It is established that peptic ulcer patients are hypersecretors. Gastric ulcer is not so much implicated here as is duodenal and there has been some consideration given to their being of different origin.[3] the average normal nocturnal gastric secretion is 650 cc. The average in duodenal ulcer is 2,250 cc.[6] This gastric juice both in normal and ulcer patients is of constant acidity so far as secreted concentration is concerned and the fault lies in total secretory volume rather than in higher concentrations of acid.[2] The relative proportions of gastric juice and such neutralizing substances as saliva, food, mucus or alkaline duodenal juice governs effective acidity and the proportion of gastric juice in ulcer patients is high. These facts have a great bearing on present concepts of ulcer therapy, particularly surgical.

It should also be brought out here that stomal ulcers occur almost exclusively in hypersecretors. Normal secretors do not develop ulcers at site of gastrointestinal anastomoses. Because hypersecretion is frequently present without ulcer no one can accept hypersecretion as the sole cause of peptic ulcer.

Among the earliest theories of etiology of peptic ulcer vascular thromboses figured prominently. Now certainly little credence can be given to this fault in the bulk of ulcer patients. Vascular disease may play some part in the older age group as a cause of ulcer. Peptic ulcer is not associated with known vascular disease entities in higher incidence.

Gastroscopic studies have failed to confirm the theory that hypertrophic gastritis precedes chronic peptic ulceration eliminating the inflammatory factor as definite pre-ulcer lesion.

The presence of an antipeptic mechanism, protecting the mucosa from autolysis during life is pretty well accepted but its nature and source are unknown. It is also felt that the power of this antipeptic factor diminishes down the intestinal tract.

Mucin is secreted throughout the intestinal tract and is probably concerned to some extent with ulcer prevention. There is no proof that it is decreased in amount in hypersecretors.

The factors in etiology mentioned so far are concerned with decreased local tissue resistance in gastric and duodenal mucosa. Trauma internally, thermal or mechanical, holds a shaky place in the group also. No one believes that any one of these factors when present in an individual consistently produces ulcer.

Hypermotility has been studied and theories advanced indicating it is a highly important factor in ulcer etiology. Workers have found that an ulcer would not develop in the duodenum from which muscle had been removed.[1] Ulcer pain has been shown to occur in the hyperirritable duodenum without demonstrable ulcer. Majority opinion, however, regards hypermotility as contributing to pain but of minor importance as a cause of ulcer or in determining chronicity.[2]

*From the Department of Internal Medicine, and presented at a Staff Conference of the Winchester Memorial Hospital, Winchester, Va., February 20, 1952.

Heredity and Constitution: Peptic ulcer is a disease of civilization. Studies done in races not exposed to the stress and strain of civilization indicate absence of the disease despite the absence of striking comparative difference in gastric physiology. Aside from psychogenic inferences concerning ulcer etiology, the concept of ulcer predisposition on the basis of inborn structural autonomic nervous system disturbances must be considered. There is evidence of a tendency for ulcer to occur in families and these families secrete appetite juices excessively.[1] Along these lines it has been shown that operative and traumatic procedures involving certain areas of the brain will cause acute mucosal erosions in the esophagus, stomach and duodenum. Parasympathetic mediation is thought probable.[1]

Vagal stimulation, of course, produces hypersecretion and hypermotility. Sympathetic stimulation produces the reverse and even increases secretion of mucin. Removal of sympathetic inhibition is associated with hypersecretion. The old question of nicotine as a factor in ulcer may be mentioned here in that nicotine-sensitive persons sustain a retardation of sympathetic activity and increased gastric secretion.

Vagotonia is considered important as part of the symptom complex in ulcer causation and some of the signs are usually apparent in ulcer patients (low blood pressure, slow pulse, contracted pupils, increased lacrimation, hypersalivation, gastric hypersecretion, hyperperistalsis, hypertonicity, spastic colon, dermographism, and decreased atropine sensitivity).

In recent years a great deal of attention has been given to the influence of psyche over soma and no organic entity has received more consideration along this line than has peptic ulcer. Undoubtedly autonomic centers in the diencephalon play a part in affective behavior. Impulses originating from emotional influences are sent to somatic muscle, viscera and the cerbral cortex. Cortical impulses also activate autonomic centers and with such an interplay the probability is that a direct relationship exists between cerebral function and gastric activity.

Wolf, with his fistulous subject, demonstrated the effect of emotions on secretions, muscle tone and vascularity in the stomach.[3]

Summarization of his findings obtained by direct examination of gastric mucosa indicates that gastric hyperfunction can be induced by situations engendering anxiety and associated with hostility and resentment. On maintaining the gastric mucosa in this hyperemic, turgid state the pain threshold was reduced. Gastric contractions causing no discomfort when the mucosa was in resting state caused characteristic ulcer symptoms when in the hypersecretory state. It was also shown that intact vagi were essential for causing the hypersecretory response.

Again, however, no single etiologic pattern for peptic ulcer can be implied. Ulcer patients do react to stressful situations by gastric hypersecretions but why is not known. It is contradictory that an individual would elect a pattern of reaction to stress which in itself is destructive. Reasons for such a course of action can only be answered by an analogy that bears repeating, involving the challenged man who can select a weapon and fight, run away, collapse, or make a joke of the issue. His choice depends not on a single instinct but on the complexity of inherited tendencies, experience, cultural background, habits, skills, *et cetera.*

Endocrine influences in peptic ulcer deserve brief mention. Posterior pituitary extract in sufficient amounts will cause a decrease in gastric secretory function. Sex hormones are felt of some importance because the evidence of ulcer in pregnancy is nil and the incidence before puberty is equal in both sexes.

Urogastrone has been isolated from urine and has been shown experimentally to inhibit ulcer formation. Some workers have found it low in ulcer patients.[1]

Enterogastrone from intestinal mucosa reduces gastric secretion and inhibits ulcer experimentally.[1]

Insulin is known to stimulate the flow of gastric juice and ulcer is common is hypoglycemic patients.

The influence of other factors, of infectious foci, allergy, and nutrition, bear no comment in detail.

MEDICAL THERAPY IN PEPTIC ULCER

The review to follow of current thought on therapy will be confined to antacid and antisecretory measures about which enough investigation has been done to come to at least partial conclusions.

Dr. Sippy's innovation in 1915 embraced the idea of maintaining the gastric contents "neutral," which we know now to mean at a pH certainly above 3 and preferably between 4 and 5. His plan involved three to four weeks of bed rest, hourly feedings, 7 A. M. to 7 P.M., powder alkalies, 7 P.M. until 10 P.M. and then, if nocturnal acidity was found high, the stomach was drained.[8] For the most part the hours

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between bedtime and morning were not attended by specific antacid therapy.

The neutralization obtained was only relative by this method. Aims of antacid therapy now are, or should be, toward absolute neutralization of free acid. Of the methods used currently or in the recent past, the following paragraph will deal.

Kirsner, Palmer and others have recently reviewed the subject of antacids[7] and many of their conclusions will be mentioned.

The ideal antacid should be:

1. Palatable
2. Free of untoward reactions—
   a—Acid base equilibrium
   b—Not constipating
3. Capable of prolonged neutralizing effect when given in small quantities
4. Devoid of ability to produce secondary secretory rise
5. Low cost.

Calcium carbonate in hourly doses of 2-4 grams usually maintains pH at 4.0 and, if given with atropine, improves the antacid effect, due to decreased motility and gastric emptying. No alkalosis occurs with calcium carbonate and its constipating effect can be overcome by concomitant administration of magnesium oxide.

Aluminum hydroxide has a neutralizing power that theoretically equals that of calcium carbonate but actually is felt not quite as good because in the stomach aluminum chloride is formed. With hourly doses of 30 cc. the pH in ulcer patients can be kept around 4. There is considerable constipation tendency. There is variance in neutralizing power in various commercial preparations.

It should be mentioned here that tablet forms of antacid are in general less effective than powders or liquid, because in tablet form smaller amounts enter into reaction with hydrochloric acid before being emptied into the intestine.

Of the many magnesium compounds none seems held in high esteem due either to relatively poor acid absorptive power or cathartic side effect. Their chief use is in combinations (liquid or powder).

Other antacids, as sodium carboxymethyl cellulose, mucin prepared from hog stomach, protein hydrolysates, anion exchange resins, and detergents have enjoyed some favorable publicity, but, in the last analysis, have proved less valuable than calcium carbonate or aluminum hydroxide gel because of poor absorptive and neutralizing power, dosage requirements, or cost.

Rossett and Flexner in 1944 published an interesting study on pH response to various antacids by using a continuous pH recorder in the stomach. They found that calcium carbonate or several of magnesium compounds (particular emphasis on milk of magnesia) when mixed with an amphoteric substance such as milk or aluminum hydroxide gel, were buffered in the alkaline range, preventing secretory rebound and producing long acting antacid effect. In *in vitro* experiments one gram of calcium carbonate alone could be depended upon to maintain pH at about 3 for about 1½ hours, 1 gram of $CaCO_3$ in 200 cc. milk would maintain free hydrochloric acid neutralization for 2½ hours or more, and 45 cc. of a mixture of aluminum hydroxide and milk of magnesia in the ratio of 4 parts to 1 part would give the same effect for 5½ hours. *In vivo* these times were reduced proportionately but the fundamental principle applied and a much longer-acting antacid produced.

Rossett has more recently published a follow-up, using the principles brought out above.[8] In the treatment of 1,288 cases of peptic ulcer the method used did not fail once to stop ulcer pain and produce healing. There has been no instance of hemorrhage, obstruction or perforation while under treatment. There were two deaths from massive bleeding in whom the treatment was never started. His patient group included uncomplicated peptic ulcer, bleeding peptic ucer and peptic ulcer with obstruction. All patients were hospitalized.

In the uncomplicated ulcer patient the dietary principles were broader than those in general acceptance. The patient was started immediately on the diet he would retain. Antacid was supplied throughout the 24 hours when stomach would have been empty and aluminum hydroxide—milk of magnesia mixture, 4 parts to 1 part, was commonly used. Tincture of belladonna was the antisecretory measure. Bed rest until five days after disappearance of pain was enforced. 8 A.M. stomach emptying was an innovation and stomach contents were tested for neutralization.

Changes were made for bleeding ulcer. Aluminum hydroxide was not used during bleeding (caution given against its use when protein of any type was in the stomach) because a coagulum was found to form that was very constipating and potentially ob-

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structing. Here 0.9 grams calcium carbonate and 0.1 gram magnesium oxide were added to milk and partial neutralization begun. A modified Meulengracht diet was started immediately and patient gradually worked into the uncomplicated ulcer regimen.

Obstructive ulcer was treated by drainage, feedings of boiled skimmed milk in amounts equal to amount passing through the stomach per day. Tincture of belladonna, nocturnal neutralization with aluminum hydroxide-milk of magnesia and parenteral fluids. Uncomplicated ulcer regimen was begun when 3,000 cc. of liquid diet passed through per day.

All demonstrable ulcer craters healed within 6 weeks with an average time of 15 days for 506 duodenal craters and 17 days for 36 gastric craters.

This series is remarkable. Most of the conditions of therapy are readily reduplicable. It makes the problem of intractable ulcer seem very small.

The last of the measures to be considered in ulcer therapy involves the use of anti-secretory drugs. There is, of course, nothing new about the principle, but in the past two years some advances have been made creating considerable investigative work.

There are a surprisingly large number of substances producing depression of gastric secretion. All of the following have some propensity in that direction:

Antihistamines	Dibutoline
Enterogastrone	Prantal (organic compound under investigation)
Urogastrone	
Sex hormones	Barbiturates
Atropine	Posterior pituitary extract
Atropine analogues (Trasentin, Pavatrine)	Urea
Tetraethyl ammonium chloride and bromide	Quinine
Methantheline (Banthine)	Atabrine
Hexamethonium Iodide	Paludrine

Of this list, only a few bear discussion at this time. Enterogastrone is a hormone elaborated by the mucosa of the upper small intestine and is responsible physiologically for the secretory and motility depression occurring when adequate concentration of fat or sugar are in the lumen of the upper intestine. Large amounts of the extract given intramuscularly cause decrease in secretion in ulcer patients but the effect is transient and variable. The substance is not useful practically. It has no effect when given orally.[7,11]

Urogastrone is an extract from male and non-pregnant female urine which, when given parenterally, is apparently capable of depressing gastric secretion. Practical therapeutic results have been inconsistent.[7]

Uroenterone is an extract of pregnant mare's urine. It was suggested as a therapeutic agent because of the absence of peptic ulcer in pregnancy. Work has been done on patients with "intractable" peptic ulcer and reports of effectiveness are good in the one article published.[9] It is effective orally, but expensive.

The sex hormones have been investigated because of preponderance of ulcer in males and absence of ulcer in pregnancy. Of the many studies mentioned in review,[7] little practical application seems forthcoming. It is well to mention that ACTH therapy in ulcer patients has been associated with hemorrhage and perforation and the use of ACTH is probably contraindicated in these patients.

Atropine exerts its effect peripherally by preventing response of the vagal neurocellular junction to acetyl choline. This effect is less pronounced in ulcer patients than in normal. Its effectiveness is limited by the side reaction. The synthetic atropine-like compounds are less effective than atropine.[7] A group of drugs known as quaternary ammonium compounds and including tetraethyl ammonium chloride and bromide, and hexamethonium iodide have in recent years been found to block the sympathetic and parasympathetic impulses at the autonomic synapse (in ganglia). They are thereby capable of reducing gastric secretion markedly. The side effects, particularly the tendency to produce hypotension, and the transientness of action make them of small value in the treatment of ulcer. Tetraethyl ammonium chloride has been found useful in relieving pain of ulcer when pain has been difficult to manage by usual methods.[10] However, the work on the quarternary amines leads to the discovery of methantheline (Banthine) which has produced a great deal of investigation. Banthine was found to have a selective affinity for the parasympathetic synapse, although partial blockage of the sympathetic flow also occurs. It also has the atropine effect at the vagus nerve ending peripherally.[12]

The original reports on marked secretory depression[12,14,13,15] have become modified. Significant decrease in gastric secretion is, however, generally acknowledged.[7,16] Several reports indicate poor ob-

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jective response so far as healing is concerned in gastric ulcer.[17,15]

Gastric motility is definitely decreased and emptying time retarded on Banthine.[16,12] The prompt relief of pain[8,13,17] is probably closely related to this effect.

Banthine probably influences the rapidity of healing insignificantly[16] despite earlier claims. Its side effects are those of atropine and probably more intense.

Contraindications to the use of Banthine are prostatism, heart disease, chiefly myocardial, adynamic ileus and incipient glaucoma. It is also possible that in obstructive duodenal ulcer the delay in emptying may be enhanced by Banthine, and atropine or belladonna may be preferable.[8]

In summary, it appears that Banthine is of value and, because its secretory inhibitory effect is relative, should be used in conjunction with established ulcer regimen. It is stressed that tolerance to Banthine does develop with gradual diminution of response.[16]

CONCLUSIONS

The conclusion permitted is that there is no single cause for peptic ulcer. Rather one must think of an etiologic complex conditioned by central and automonic nervous system influences, constitutional diathesis, psychogenic factors, and variables in gastric physiology. Acid and pepsin are essential to the presence of ulcer. The reason for circumscription is unknown.

In treatment, emphasis deserves to be placed on the inadequacy of occasional antacid administration as therapy in ulcer. The aim must be sustained gastric-content neutralization. This may be accomplished by the proper use of food, antacids and antisecretory drugs. It is unnecessary to use a graduated series of diets for the uncomplicated ulcer, or to subject him to a slim selection of foods.

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A RÉSUMÉ OF THE SURGICAL TREATMENT OF PEPTIC ULCER*

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The term "peptic ulcer" has been so thoughtlessly used that it has all but lost its meaning. It is used to include ulcer of the stomach and duodenum, ulcer of the margin of a surgically produced stoma, ulcer of heterotopic gastric or duodenal mucosa; and, unfortunately, it has become a popular stereotype used for many vague forms of functional dyspepsias. It is used too often without sufficient clinical and x-ray studies having been made to support the diagnosis. The term should never be used unless clinical and laboratory studies can corroborate it. Its usage evokes anxiety in a neurotic individual without ulcer; fear and worry in an individual with an ulcer, unless it is most prudently employed. Here the term will be used only in the discussion of ulcer of the stomach, duodenum and the margin of a stoma following gastroenterostomy or resection.

Etiology and Location of Peptic Ulcer. Many etiologic factors, undoubtedly, exist for the formation of peptic ulcer and it is reasonable to assume that the principal factor for the causation of gastric and duodenal ulcer are separate and distinct. However, no factor of consequence has been proven for either.

A large resection of the stomach and duodenum will remove the antral factor which has been shown by Dragstedt and his associates to reduce the amount of gastric secretion produced by the remaining portion of the stomach and to reduce the values of combined and free acids. From their experimental work in dogs they hold the view that a hormonal secretion in the antrum plays a part in the causation and activation of peptic ulcer. They have demonstrated that a Pavlov pouch plus transection of the vagus, a Heidenhain denervated pouch, or an isolated stomach by-passed by an esophago-duodenal anastomosis will almost abolish gastric secretion. With the vagus nerves cut and the antrum of the stomach transplanted into the duodenum, jejunum, or colon so that it can be stimulated by food, the gastric secretion in the pouch will be increased. Therefore, it might be concluded that the activating mechanism might be vagus stimulation plus antrum hormone. This experimental surgery may have shown the reason for the good results which have followed resection of the stomach in peptic ulcer.

Disregarding the causation of chronic indurated ulcer of the stomach and duodenum, there has never been an explanation as to their location; the chronic indurated ulcer of the stomach generally occurs on the lesser curvature between the incisura angularis and the pylorus and its ulcerated base is the gastrohepatic omentum with a tendency for the ulcer to be on and progress along the posterior wall; the chronic indurated ulcer of the duodenum generally occurs on the posterior wall and its ulcerated base is the head of the pancreas.

PATHOLOGY AND PHYSIOPATHOLOGY

Acute Peptic Ulcer. An ulcer of the stomach or duodenum may be acute. It may be superficial, especially in the stomach, or the necrosis may be so great that all of the layers of the wall are involved and perforation will occur. The mechanism of acute perforation may be a sequence of pathologic changes produced by vascular spasm, thrombosis and necrosis. Upon the size of the area of necrosis depends the size of the perforation. Small perforations will sometimes only permit of small leakage into the peritoneum; large perforations will permit of greater leakage. The amount of gastric tension at the time of perforation will also be a determining influence upon the amount of gas and chyme that escapes into the peritoneum. The acute ulcer that perforates is generally on the anterior wall.

Chronic Indurated Peptic Ulcer. An ulcer of the stomach or duodenum may be chronic. It may be penetrating or perforating in character, but seldom perforates. It may heal spontaneously. It may recur. It has a tendency to bleed and the bleeding has a tendency to recur. The amount of hemorrhage will depend upon the size of the artery that has become necrosed. Indeed, the loss of blood may be so massive that death will occur before replacement can be made.

SURGERY

Indications for Surgery. The treatment of ulcer of the stomach and duodenum is primarily medical and dietary management. The indications for surgery in ulcer of the stomach and duodenum are quite generally

*From the Department of Surgery, and presented at a Staff Conference of the Winchester Memorial Hospital, Winchester, Va., February 20, 1952.

recognized today by all. If a patient is referred for a surgical procedure, the medical and dietary treatment should be carried out by the physician during the preparation for surgery, the convalescence, and the period of adjustment that is necessary after surgery if the best results are to be obtained.

Chronic Indurated Gastric Ulcer. Because carcinoma is so commonly found in chronic indurated ulcer of the stomach, and because there are so few with carcinoma of the stomach who are saved, the importance of surgery should be stressed in cases of chronic indurated ulcer of the stomach. We do not defer advising the patient with chronic indurated ulcer of the stomach to have a surgical operation. We do not place too much dependence upon an x-ray study that an ulcer of the stomach has healed. We do not evaluate the size of an ulcer of the stomach by x-ray shadows. We do not entertain the view that a small ulcer of the stomach is not malignant. We do not accept the teaching that ulcer of the stomach in certain locations is not malignant. Chronic indurated ulcer of the stomach should always be looked upon as being a dangerous site for carcinoma and should be treated surgically by resection.

Chronic Indurated Duodenal Ulcer. Because some cases of ulcer of the duodenum are unmanageable on a medical and dietary regimen surgical treatment becomes necessary.

Progressive Ulcer Symptoms. Uncontrolled symptoms, including pain, in a patient who has been on a strict medical and dietary regimen is an indication for surgery. The severity of pain is difficult to evaluate and should not be the determining factor. The entire clinical picture must be considered. Uncontrolled symptoms and bleeding indicate the ulcer is progessively getting worse.

Bleeding from an Ulcer. Hemorrhage may manifest itself by causing weakness which is accompanied by tarry stools, an anemia which does not respond to treatment because of almost constant oozing of blood, or a sudden severe loss of blood producing vomiting of blood, tarry stools, collapse, and shock. When hemorrhage occurs and is managed by replacement and supportive therapy the indication for surgery still exists as recurrence of hemorrhage is a common observation. Massive hemorrhage from an ulcer that continues when large volumns of blood are replaced must be looked upon as a surgical emergency.

Acute Perforation. Until quite recently an acute perforation of an ulcer had been looked upon by everyone as a complication requiring immediate operation for its closure. The tragic thing about this treatment is that it carried a hospital mortality of 22.8 per cent in 16,843 cases in the reported series in the surgical literature from 1930 to 1948. Antibiotic and bacteriostatic substances have not reduced the mortality greatly as the deaths are not due to infection. Most of the deaths have been brought about by thrombophlebitis and phlebothrombosis with pulmonary embolism, infection with dehiscence of the wound, intraperitoneal and subphrenic abscess, fistula, and ileus. Then there is an added mortality which has never been determined because of the necessity of secondary operations. The suturing of the perforation has not always been successful and, consequently, there have been many instances of leakage and actual reperforation following suture. Recently non-operative treatment of this acute complication has been employed by some surgeons.

Pyloric Obstruction. Inflammation extending into the pylorus and resulting in secondary stenosis or an actual cicatrix of the duodenum will cause obstruction and must be relieved surgically. Other conditions, such as inability to follow a medical and dietary regimen on account of occupation or economic reasons, might at times be considered as the reason for surgery.

OPERATIVE PROCEDURES

Resection of the Stomach and Duodenum. One who undertakes to treat gastric or duodenal ulcer surgically must have a knowledge of the pathology and physiopathology of these conditions if one attempts to carry out a surgical procedure for the (a) excision of the pathological lesion, (b) the reversal of the physio-pathologic state to a condition nearer normal, and (c) at the same time maintain a good functional apparatus that will be unfavorable for the recurrence of an ulcer. This has best been accomplished by resection of the first portion of the duodenum with a large portion of the stomach. It will remove the pathologic lesion whether it be a gastric or a duodenal ulcer. If it includes all of the lesser curvature, it will remove the area where 95% of all peptic ulcers occur. If approximately three-fourths of the stomach is removed, the volume of gastric secretion will be lessened and the values for combined and free acid will be markedly reduced. If the continuity of the gastrointestinal tract is reestablished by a normal continuity of the stomach to the duodenum or by anastomosing the stomach to the jejunum near the ligament of Treitz, through the transverse mesocolon, the normal physiologic state

will be nearly approached because the gastric chyme will be quickly acted upon by the pancreatic secretion and bile.

Morbidity and mortality following surgical resection has been greatly lowered in recent years, as was shown by Glenn and Harrison who reported 100 consecutive resections with the loss of only one patient or a mortality of one per cent.

Gastroenterostomy. Gastroenterostomy still has its place, although it has been greatly maligned. Its usefulness is best illustrated in relief of obstruction in secondary stenosis of the pylorus and cicatricial stenosis of the duodenum. It may also be used in individuals who would be considered poor risks for resection of the duodenum and stomach. When a gastroenterostomy is made, it should be done by anastomosing the jejunum to the posterior wall of the stomach through an opening in the transverse mesocolon by the method of Dr. W. J. Mayo.

Vagotomy. Sectioning of the vagus nerves in the esophagus just at or above the cardia has recently been revised and advocated by Dragstedt and his associates. Dragstedt has been very convincing in his writings and discussions but the procedure has not been widely adopted. Its surgical application has not as yet been established.

Surgeons who employ vagotomy in the surgical treatment of peptic ulcer use it only in case of duodenal ulcer and most of them do a gastroenterostomy at the same time. Some surgeons have been doing vagotomy only in the treatment of marginal ulcer.

Suturing of Perforated Ulcer. Suturing of a perforation of the stomach or duodenum is almost always done as an emergency surgical procedure without preparation of the patient. The hazard of operation is great and the accomplishment of closure of the perforation is doubtful. If the hazard were not great, the morbidity and mortality would be lower; if the closure by suture were simple, there would not be so many and varied methods of doing it. The reason for the many methods is because of the fact of reperforation.

Non-Operative Treatment of Perforated Ulcer. In 1945 it occurred to me that another form of treatment might be more effectual, and, after considerable thought and planning, it was instituted. Chemical inflammation of the peritoneum was known to be always present; bacterial peritonitis was known to follow. Penicillin and sulfadiazine were then available and I reasoned that if the bacterial peritonitis could be prevented the other serious causes of the morbidity and mortality could be avoided. Then, too, I had observed an occasional case that had not been operated upon because the patient was not brought into the hospital at the time of the acute perforation, but was admitted later for the drainage of a localized collection of material in the abdomen. From these patients it was learned that they had gotten along very well after the first few days following the perforation.

When the non-operative treatment was instituted the results in the first few cases were very gratifying. Since then it has been carried out by a number of surgeons and the reports have been generally good. The treatment consists of gastric suction, supportive therapy and antibiotics. The details of the treatment and the results on over 100 cases have been published elsewhere.

It should be pointed out very clearly that all cases of acute perforation of a peptic ulcer should be studied clinically after convalescence. Neither operative surgical closure nor non-operative treatment are definitive. Definitive surgery will be necessary in a large percentage of the cases not only on account of the likelihood of reperforation but on account of progression of the ulcer. But definitive surgery will be easier if the non-operative policy is followed than if it is done after an operation for suturing the perforation.

Marginal Ulcer and Other Ill Effects. A great decision for the surgeon to make is what to do about a marginal ulcer and how to correct other ill effects following gastroenterostomy and resection. Clinicians too often take the stand that nothing should be done but medical and dietary treatment. Most surgeons are of the opinion that if surgical operation were indicated for an original complication of peptic ulcer, it is indicated for a secondary complication following surgery. Therefore, the revision of a gastroenterostomy or the revision of a resection should be done if a marginal ulcer exists or other ill effects have resulted. With improved methods of anesthesia and particularly controlled respirations by the use of the endotracheal tube, replacement of blood loss by transfusion, and supportive therapy for the maintenance of electrolyte balance, these surgical procedures can be carried out as safely as the primary ones.

SUMMARY

From this resumé one would be inclined not to make definite conclusions as there are many aspects to the problem of peptic ulcer which are not solved.

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A MICROCOLONY TECHNIQUE FOR THE RAPID DETERMINATION OF BACTERIAL SENSITIVITY TO ANTIBIOTICS

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and
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INTRODUCTION

The established procedures for the determination of bacterial sensitivity to the antibiotics may be placed in two categories: (1) those procedures requiring preliminary isolation with subsequent tests made on the pure culture material, and (2) those procedures whereby the antibiotic material is placed on the primary isolation plates at the time the specimen is cultured. In the first case, although accurate determinations can be made, a period of three days is usually involved before the sensitivity of a particular microorganism is known. In the second case, the sensitivity can be determined in 24 hours but the distribution and prevalence of clinically significant colonies in the vicinity of the test substance may be so erratic as to make determinations difficult.

The following procedure was devised to combine the accuracy of the first category with the speed of the second. It is possible by this method to determine the sensitivity of a pure culture of organisms to the desired antibiotic in 21-to-27 hours after the specimen is received.

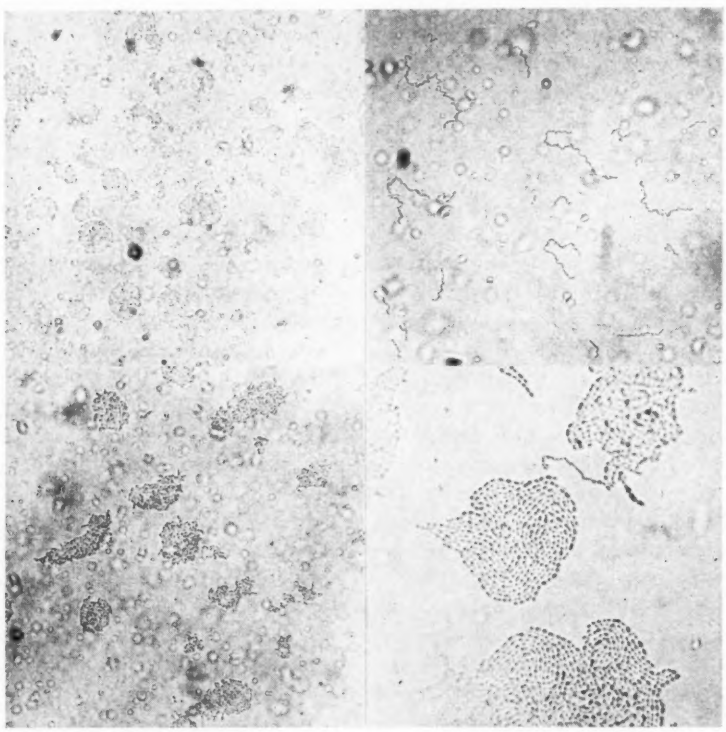

Fig. 1.—Microcolony development of *Streptococcus hemolyticus* after 3 hours' incubation at 37°C. A, Control, no antibiotics present (X 100); B, 0.15 unit/ml. of penicillin (X 200); C, 0.04 unit/ml. of penicillin (X 100); D, 0.04 unit/ml. of penicillin (X 500).

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MATERIALS AND METHODS

The antibiotics are dissolved in distilled water to give the following concentrations: penicillin, 100 units per milliliter; streptomycin, 2,000 micrograms per milliliter; aureomycin, 1,250 micrograms per milliliter; terramycin, 200 micrograms per milliliter;

chloromycetin*, 250 micrograms per milliliter; bacitracin, 600 micrograms per milliliter; polymyxin, 1,000 micrograms per milliliter. Beginning with these concentrations a series of 8 two-fold dilutions are prepared for each antibiotic. One and one-half milliliter of each concentration of antibiotic is then added to individual 20-by-150 mm. tubes containing 13.5 ml. of molten brain veal agar (Difco) held at 50°C. in a water bath. The agar-antibiotic mixtures are poured into sterile petri dishes of standard dimensions and permitted to harden on a level surface. (To ensure an even agar layer and complete utilization of the contents, select petri dishes having flat bottoms). The final concentration of each antibiotic in the brain veal agar is then one-tenth of the amount present in the water dilution.

Squares, one centimeter on a side, are cut from the hardened medium with a flattened thick nichrome wire sterilized by heating to redness in a gas flame. Relatively uniform squares are obtained by placing the petri dish over a card on which centimeter squares are drawn and tracing the outline squares with the cutting instrument.

Large (75-by-38 mm.) microscope slides are sterilized by dipping in ethyl alcohol and igniting and holding in a bunsen flame for about 10 seconds after the alcohol has burned off. The sterilized slides are placed in sterile petri dishes and permited to cool. A double thickness of filter paper or paper towel is cut into circles the size of the inner diameter of the petri dish bottom; this double layer is moistened by dipping in water and then is drained before placing in the bottom of the petri dish beneath the flamed slide. It is not essential that the bottom or edges of the slide remain sterile.

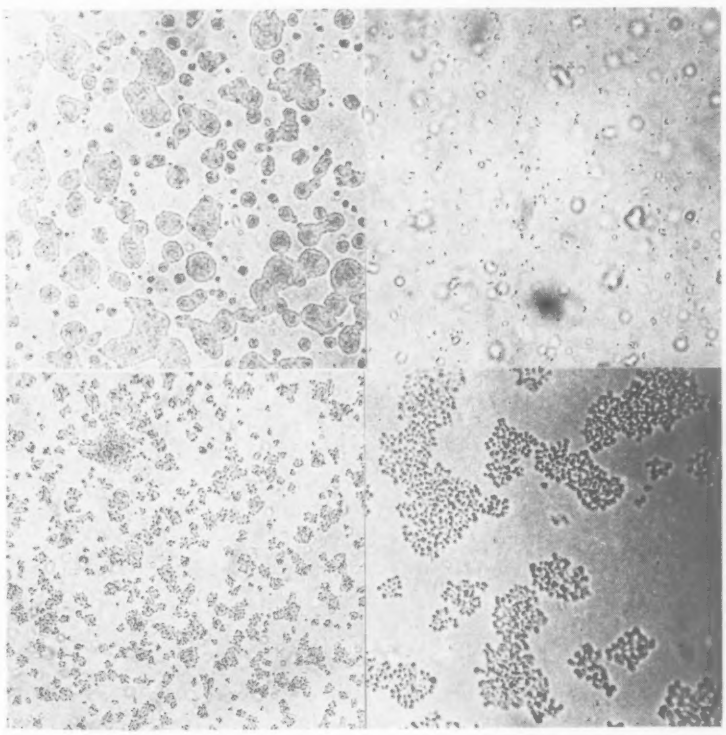

Fig. 2.—Microcolony development of *Staphylococcus aureus* after 3 hours' incubation at 37°C. A, Control, no antibiotic present (X 100); B, 0.04 unit/ml. of penicillin (X 200); C, 0.01 unit/ml. of penicillin (X 100); D, 0.01 unit/ml. of penicillin (X 500).

Squares of brain veal agar lifted (with a sterilized flattened nichrome wire) from each of the eight different dilutions of antibiotics are placed in the order of decreasing concentrations on the sterile surface of the slide. A ninth square which serves as a control is cut from a 15 milliliter brain veal agar plate that has not received any antibiotic.

*Trademark Parke, Davis & Company, Detroit, Michigan.

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The organism to be tested may be obtained from the primary isolation plate or from an over-night broth culture of the organism. An inoculum which is faintly turbid is satisfactory. Where broth cultures are employed we have found that a 1:20 saline dilution of over-night broth (Difco, brain heart infusion) is satisfactory. Where the bacteria are obtained from the primary isolation plate, they should be picked from several isolated colonies with a straight inoculating wire and introduced into sterile saline solution. If one wishes to test organisms such as streptococci, which produce small colonies, it may be necessary to pick from 7-to-10 colonies and suspend in as little as 0.1 ml. of sterile saline; however, when large colonies are under observation, fragments from 3 or 4 colonies may be suspended in a volume of 1-to-2 ml. to provide an inoculum of suitable turbidity.

Employing a 2 mm. inoculating loop, a loopful of inoculum is gently placed in the center of each agar square. It is advisable to place the liquid on the square in such a manner that the wire does not make contact with the agar surface. The inoculum is added to the control square first, then to the squares containing the antibiotic in the order of increasing antibiotic concentration. If enough inoculum is available, so that a different tube of inoculum can be used for each antibiotic to be tested, an entire series of squares may be inoculated without flaming the inoculating loop between inoculations; otherwise, it is necessary to flame and cool the loop between each application in order to prevent contamination of the inoculum with several antibiotics with consequent false readings. Since one-tenth of a milliliter of suspension is adequate to inoculate a series of nine squares, there is usually more than sufficient inoculum.

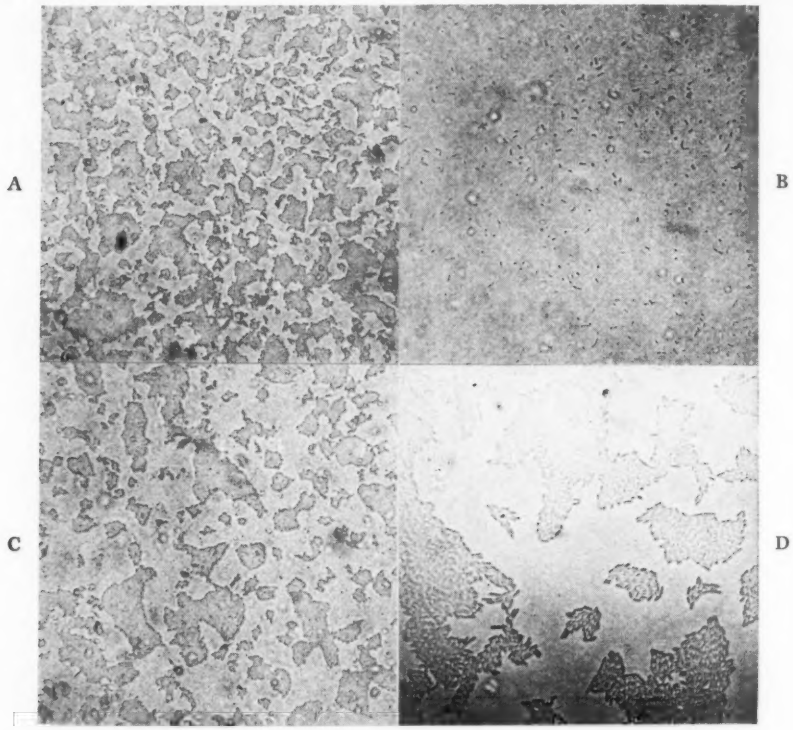

Fig. 3.—Microcolony development of *Aerobacter aerogenes* after 1.5 hours' incubation at 37°C. A, Control, no antibiotic present (X 100); B, 12.5 mcg./ml. of chloromycetin (X 200); C, 6 mcg./ml. of chloromycetin (X 100); D, 6 mcg./ml. of chloromycetin (X 500).

The inoculated slides are incubated at 37°C. in the petri dish containing the moistened paper. After 3-to-4 hours' incubation, the slide is removed from the petri dish and examined under the microscope. At this time a magnification of X 100 will reveal microcolonies present on the control square. Very rapidly growing bacteria such as the intestinal or-

ganisms may produce a confluent growth as the microcolonies coalesce. The sensitivity of the organisms to the antibiotic in the square is related to the ability or inability of the organism to develop microcolonies. The endpoint is the lowest concentration of antibiotic capable of prohibiting the development of microcolonies on the impregnated agar squares.

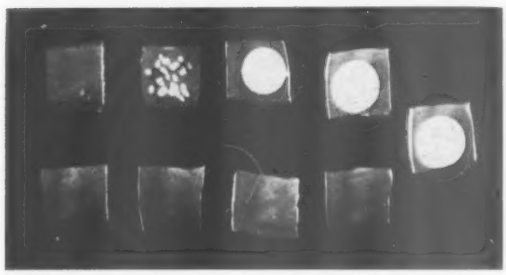

Fig. 4.—*Staphylococcus aureus* after 24 hours' incubation at 37°C. on brain veal agar squares with varying concentrations of penicillin. Penicillin units per milliliter in the squares reading from bottom, left to right: 0.6, 0.3, 0.15, 0.08, 0.04, 0.02, 0.01, 0.005. Off-center square is control with no antibiotic added.

After examining the squares the slide is returned to the petri dish with the moistened paper and incubated for an additional 18-to-24 hours for confirmation. The squares then are examined macroscopically for bacterial growth.

RESULTS AND DISCUSSION

Strains of the bacteria *Aerobacter aerogenes, Pseudomonas aeruginosa, Klebsiella pneumoniae, Staphylococcus aureus, Streptococcus hemolyticus,* and *Streptococcus viridans* were examined with regard to their sensitivity to the following antibiotics: penicillin, polymyxin, chloromycetin, aureomycin, streptomycin, bacitracin, and terramycin.

Presented in Figures 1-to-3 are photomicrographs of three of the above microorganisms depicting their response at two levels of antibiotic concentrations a few hours after inoculation. The appearance of a 24-hour specimen of *Staphylococcus aureus* on eight agar squares with different concentrations of penicillin and a control square with no penicillin is shown in Figure 4.

The sensitivity of the same strain of each of the six different species of bacteria was determined by the test tube dilution method, the disk method, and the microcolony technique. The test tube method used was similar to procedure described by Kolmer *et. al.*[3] with some minor modifications. The disk technique involved the use of commercial disks containing antibiotics and the relative sensitivity of the organism was determined according to the manufacturer's chart. The procedure for the microcolony technique was as described above; however, in some cases the concentration of the antibiotic in the first dilution was less than the concentration suggested above. The inocula used for the microcolony technique consisted of 18-hour cultures of the organisms in brain heart infusion broth diluted 1:20 in sterile saline. The comparison of antibiotic sensitivity as observed by the three methods is summarized in Table I. On the whole, the microcolony technique compares favorably with the tube dilution test and the disk method. In the case of polymyxin we found that our strains of *Aerobacter aerogenes* and *Klebsiella pneumoniae* were considerably less sensitive to the antibiotics by the tube test than by the microcolony test; however, our strain of *Pseudomonas aeruginosa* responded to similar concentrations of polymyxin in both tests. Most of the bacteria tested appeared somewhat less sensitive to terramycin when tested by the tube method than they were when tested by the microcolony technique, although the sensitivity by the latter method was comparable to that noted by the disks.

The 24-hour reading varied from the 3-hour reading by no more than a two-fold dilution except in the case of aureomycin. The inhibiting concentration of this antibiotic increased by a factor of 2-to-30 after 24-hours' incubation. This finding is consistent with the observation of Jackson and Finland[2] and has been attributed to the labile nature of aureomycin. The antibiotic sensitivity of the same strain of bacterium was found to be reproducible upon testing by the microcolony technique at intervals.

In determining the endpoint the magnification of X 100 is specified. This magnification is adequate to observe the microcolonies and also avoids inconsistencies in determining endpoint that may arise when a higher magnification is used. Some bacteria may enlarge or divide once or twice in the presence of threshold concentrations of an antibiotic. When these are observed with a high magnification they may confuse the observer, but when observed with a low magnification they pass unnoticed. We have noted in most instances that such organisms fail to develop in 24 hours beyond the stage observed at 3-to-4 hours; therefore, we feel justified in considering such a preparation as being sensitive to the an-

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TABLE

COMPARISON OF THE ANTIBIOTIC SENSITIVITY OF

	Aerobacter aerogenes Sensitivity in units or mcg./ml.					Klebsiella pneumoniae Sensitivity in units or mcg./ml.					Pseudomonas aeruginosa Sensitivity in units or mcg./ml.				
	Tube	Micro-colony 3 hr.	Micro-colony 24 hr.	Disk M.I.C.[1]	Disk Sens.[2]	Tube	Micro-colony 3 hr.	Micro-colony 24 hr.	Disk M.I.C.[1]	Disk Sens.[2]	Tube	Micro-colony 3 hr.	Micro-colony 24 hr.	Disk M.I.C.[1]	Disk Sens.[2]
Penicillin	...	....	....	....	....	...	....	....	....	....	...	....	....	....	....
Polymyxin	50	6	6	....	....	>50	3	6	....	....	6	12	25	....	....
Chloromycetin	8	12.5	12.5	0.6-9.3	S	1.5	1.5	1.5	<0.6	VS	250	>25	>25	>9.3	R
Aureomycin	31	2	62	>4.9	R	8	<1	4	4.9	R	125	62	>125	>4.9	R
Streptomycin	100	25	25	0.8-6.7	S	6	3	3	0.8-6.7	S	100	25	100	0.8-6.7	S
Bacitracin	...	....	....	....	....	...	....	....	....	....	...	....	....	....	....
Terramycin	25	5	5	1-4.1	S	12	1.2	1.2	1-4.1	S	25	10	20	>4.1	R

[1]M.I.C. Minimal inhibitory concentration in units or micrograms per ml. of medium as related to disk reading by manufacturer's chart.

[2]Sensitivity designated as R, resistant; S, sensitive; VS, very sensitive on basis of zone of inhibition measurements according to manufacturer's chart.

Leaders signify that test was not run.

tibiotic concentration of the particular square observed.

The plates containing the various dilutions of antibiotics can be stored at 4°C. for five days without loss of activity with the exception of aureomycin which must be used at once after preparation.

This technique is essentially a modification of the agar-plate dilution method described by Frank *et al.*[1] In addition to its rapidity, the method outlined above has two advantages over the agar-plate dilution method: (1) When it is desired to test the sensitivity of only one or two microorganisms the necessary squares can be removed, thus saving the remainder of the agar for future determinations. (In this connection it should be mentioned that we have experienced no difficulty with contaminants appearing on the partially used plates held for five days in the refrigerator, although squares were removed in the open laboratory with no unusual precautions.) (2) Whereas the presence of a single spreading organism obscures all observations on a given plate in the agar-plate dilution method, this difficulty is avoided by the isolation of the squares on the glass slide.

The titration of the sensitivity of an organism to an absolute endpoint is unnecessary for routine clinical work, in which case we suggest that two concentrations of an antibiotic be tested for screening purposes; one a high concentration, the other a low concentration of the antibiotic within the range of clinically attainable levels. The slide described will hold ten agar squares; Therefore, on one slide a control square and eight squares representing four antibiotics at two levels can be used in testing the relative sensitivity of an organism.

SUMMARY

This paper describes a method for determining the antibiotic sensitivity of microorganisms, which depends upon the inhibition of microcolony development as its endpoint.

The microcolony technique enables one to determine antibiotic sensitivity of many organisms in as few as 3 hours.

This method is economical in labor, requires only standard laboratory equipment, and can be altered to comply wth the specific needs of any clinical laboratory.

ACKNOWLEDGMENT

The authors wish to express their appreciation for suggestions and materials from Dr. W. C. Thomp-

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SIX BACTERIA AS DETERMINED BY THREE METHODS

Staphylococcus aureus Sensitivity in units or mcg./ml.					Streptococcus viridans Sensitivity in units or mcg./ml.					Streptococcus hemolyticus Sensitivity in units or mcg./ml.				
Tube	Micro-colony 3 hr.	Micro-colony 24 hr.	Disk M.I.C.[1]	Disk Sens.[2]	Tube	Micro-colony 3 hr.	Micro-colony 24 hr.	Disk M.I.C.[1]	Disk Sens.[2]	Tube	Micro-colony 3 hr.	Micro-colony 24 hr.	Disk M.I.C.[1]	Disk Sens.[2]
0.04	0.04	0.04	<1.8	VS	0.08	0.08	0.08	<1.8	VS	0.08	0.08	0.08	<1.8	VS
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
12.5	6	3	0.6-9.3	S	6	6	3	6-9.3	S	12.5	6	6	6-9.3	S
1	1	<1	0.6-4.9	S	<1	<1	2	>4.9	R	1	4	4	>4.9	R
12	3	3	0.8-6.7	S	12	12	12	>6.7	R	25	25	12	>6.7	R
2	4	2	0.8-3.1	S	0.1	1	1	>4.1	R	1	0.25	<0.1	>4.1	R
1.5	0.3	0.15	<0.25-2	VS	0.8	0.15	0.15	0.25-2	VS	1.5	1.2	0.6	1-4.1	S

son, Jr. Also, the authors wish to thank Mr. M. C. Shaffer for making the photomicrographs, and Parke, Davis & Company, of Detroit, Michigan, for supplying the chloromycetin used in this work.

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AMA Publishes Health Insurance Booklet.

The seventh annual revision of the health insurance brochure published by the Council on Medical Service and its Committee on Prepayment Medical and Hospital Service now is available to physicians and allied groups. In this booklet—"Voluntary Prepayment Medical Benefit Plans"—each plan is described by summary of benefits, enrollment at the end of 1952 and other pertinent data. Separate sections list plans by type of sponsorship. Also identified are plans which have been granted the Council's seal of acceptance. One section is devoted to Canadian plans which have been organized or approved by the provincial branches of the Canadian Medical Association. In addition, other types of programs are described to give examples of voluntary methods of insuring some of the costs incident to health care. Single copies are available, without charge, from the Council.

XUM

NEONATAL ASPHYXIA DUE TO BILATERAL CHOANAL ATRESIA*

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Congenital atresia of the posterior nasal choanae is being reported with increasing frequency. The atresia may be unilateral or bilateral, complete or incomplete, bony or membranous. This paper deals with the complete bilateral atresia as this is the only one causing neonatal asphyxia.

The first case was reported by Otto[1] in 1829 describing this deformity in a foetus seen at autopsy. By 1948 Wilkerson and Cayce[2] had collected 269 cases to which they added 6 more. With the five additional cases reported by Medovy and Beckman[3] in 1951 and other scattered reports, the total is now at least 283 cases. Pastore and Williams[4] at the Mayo Clinic found 12 cases from 1903-1939. Almost exactly half of the cases reported were bilateral, and at least 46 of these were not discovered until adult life, showing that certainly some survive the newborn period without serious result. No case has been seen at the Medical College of Virginia Hospital since 1932.

About 90% of these obstructions are bony and 10% are membranous. Anatomically the bony obstruction is bounded superiorly by the body of the sphenoid and the vomerine ala, medially by the posterior border of the vomer and the nasal crest of the palatine bone, inferiorly by the hard palate, and laterally by the medial lamina of the pterygoid process.

There are several theories as to the etiology but most authorities agree that the abnormal tissue is a vestige of either the bucconasal or buccopharyngeal membrane.

Symptoms of the bilateral type seem to be consistent with all cases. There are periodic attacks of cyanosis occurring immediately after birth. The cheeks are somewhat sucked in. There is a marked heaving of the chest with substernal retraction and a suffusion of the face. If the lower jaw is depressed the infant will gasp for air and the color improve. On his own he may struggle more and more vigorously to breathe, becoming more suffused in the face and finally, giving up, it cries, which improves the color. As he relaxes the cycle is started all over again.

*Presented to the Richmond Academy of Medicine January 27, 1953, and to the Fetal and Neonatal Mortality Conference, at Richmond, February 11, 1953.

The differential diagnosis must include all cases thought to have atelectasis but do not have enough X-ray changes to warrant the symptoms. Also, any child being treated for an enlarged thymus who is having repeated cyanotic attacks must be considered. After an obstruction of the nose has been found, a nasal polyp must be excluded.

Obviously the treatment for this condition is surgical. The types of operations are many and varied. Almost all the children who have had the operation early have had to have a repeat procedure at a later date. Simply punching through the bony obstruction or biting out pieces with a gouge forceps is not enough since there is a rapid reformation of the septum and the process has to be repeated. A good vision of the operative field should be obtained so that the entire bony plate can be removed as well as a small portion of the nasal septum. Many successful operations have been performed. Reference may be made to a case described by Stoner and Freeman[5] who, after fracturing the inferior turbinates, broke through the bony partition with a gouge, enlarged the opening with a sphenoid punch, and inserted the inner tube of a #2 tracheotomy tube. This was done on both sides and the tubes changed daily. The obturators were removed on the 17th day, and 9 months later the patient still had patent posterior choanal openings.

The following case is reported mainly to bring to mind this condition, and thereby save the lives of those newborns who are unable to make the adjustment from nasal to mouth breathing by themselves.

CASE REPORT

E.J.P., a 7 pound white female, was born 7/28/52 following a normal prenatal course with no accidents or illnesses, and with no history of any familial disease. She was a well developed infant appearing normal and with no deformities seen. However, due to cyanosis immediately following birth, the infant was given oxygen in a heated crib. Her color remained ashen or cyanotic in spite of this and seemed to be cyclic in nature. Considerable bloody mucus was aspirated from the throat during the first 12 hours. The child appeared to be in shock for which parenteral fluids and coramine were

given. I was called into consultation and first saw the child 20 hours after birth. At that time she was in a moribund condition and was receiving resuscitation by Dr. Mack without which she most certainly would have died. Previous to this resuscitation she had been making marked efforts to breathe by strong elevation of the chest and substernal retraction. Following this effort she became limp and pallid. I then noticed that if the lower jaw was depressed and the tongue pulled forward, the child gasped, started to cry, and the color improved. As soon as the lower jaw was allowed to close, the symptoms returned. Therefore, a metal airway was inserted temporarily, and this allowed good color to be maintained.

With the probable diagnosis of choanal atresia in mind, a #8 catheter was passed into the nose and encountered an obstruction about five cm. back on each side. With a metal probe this felt like bone. There was a great quantity of clear gelatinous mucus in each side of the nose through which no air passed.

Dr. Montague was called as to the advisability of a tracheotomy or any other surgical procedure to provide temporary relief. He performed a tracheotomy, and from that moment on the child progressed nicely. 300,000 units of Crysticillin were given daily for four days. She regained her birth weight by the tenth day, and continued to gain, weighing 9 lb., 4 oz. at seven weeks of age. The X-ray of her chest was normal at birth and before discharge from the hospital. The blood count was 4,850,000 R.B.C. with 92% Hgb.

DISCUSSION

Congenital occlusion of the nasal choanae must be considered as a very definite cause of neonatal asphyxia. It is much more serious in the first two weeks of life because of the dependence of the newborn on nasal breathing. This child most certainly would have died if immediate steps had not been taken to give it an airway. The tracheotomy allowed this child to make a normal newborn gain without the usual malnutrition developing or having a marked feeding problem for the nursing staff in the hospital or the mother at home. An operation may be done in the future on a child in a good nutritional state, and because of the tracheotomy an easy anesthetic will be possible.

Ronaldson[6] stated in 1889 that following a series of autopsies on infants who died of asphyxia neonatorum, congenital occlusion of the nasal choanae was a frequent cause of death. No details are given. I have witnessed many newborn autopsies and as yet have to see one in which there has been an attempt to demonstrate patency of the nares. I am sure that if this is made a routine part of the autopsy there will be a marked increase in the number of cases reported.

This condition should be considered in any child in the newborn period that is having periodic attacks of cyanosis, or one in which the diagnosis of atelectasis or enlarged thymus has been made but can not be proven by X-ray. Upon closer examination it is noticed that with these cyanotic attacks the infant's cheeks may be sucked in, there is a heaving of the chest, and a marked suffusion of the face. As the child begins to cry the respiration is gasping until enough oxygenation has taken place to make it more comfortable. Color improves with crying rather than getting worse as it might do in a case of atelectasis. When he begins to drop off to sleep and the mouth is closed, the whole cycle is repeated. This may be prevented by doing a tracheotomy, which, incidentally allows the child to eat readily from the bottle. The other more tedious method is to keep someone in constant attendance throughout the first two weeks to see that the lower jaw is depressed. Some men may feel that it might be good judgment to do a poor initial job with a gouge, with the full expectation of doing a plastic later.

The clear viscous secretion in each anterior nares seems to be a constant finding in these cases. Any attempt, of course, to pass a blount probe or catheter meets with failure, the obstruction being met about 5 cm. back. If the obstruction feels membranous rather than bony, the gouge method would, of course, be the temporary choice.

The patient undiagnosed until later in life will complain of the absence of smell, poor taste, and the constant thick mucus from the nose mixed with all of the tears draining anteriorly.

SUMMARY

A case of neonatal asphyxia due to bilateral congenital choanal atresia has been presented. The incidence of death from this cause may be drastically reduced by simple early diagnosis. A tracheotomy is the initial surgical procedure of choice for the relief of symptoms, and to simplify newwborn care.

XUM

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421 West Grace Street.

Causes of Children's Headaches Legion.

Headaches in children are as varied and as widely dissimilar as they are in grownups. They may be caused by eyestrain, illness or excitement, or may be a simple excuse to escape from an unpleasant task, according to Dr. Noah D. Fabricant, Chicago.

Whatever their cause and whether they are simple or complex, children's headaches are fairly obvious and yield handsome response to medical care, Dr. Fabricant wrote in the current Today's Health magazine, published by the American Medical Association.

Eyestrain is one of the better known causes of headaches in children, he stated, adding:

"Temporary blurring of vision is experienced, and the eyes feel tired, hot and gritty—a feeling that may eventually give place to a dull ache. They tend to become reddened and watery, and chronic irritability leads to constant rubbing of the eyes. Headache may occur in every possible nook and corner of the head, from the top of the skull to the nape of the neck. It can show up as a dull, persistent pain in the forehead, the back of the eyes or the region of the temples."

Another cause of children's headaches is anemia, Dr. Fabricant said. A simple blood examination will confirm this, and relief can be obtained quickly by adequate treatment. Children also frequently complain of headaches upon arising in the morning and immediately after naps. Such headaches, he said, may represent a need for carbohydrates—a need which can be remedied by additional consumption of sweets.

Acute illnesses commencing with high fever may cause headaches in children, Dr. Fabricant stated. A headache may be an early symptom of scarlet fever, mumps, measles, chicken pox, kidney disorders, poliomyelitis, or an infection in the ear.

However, a child may just have "headaches of convenience," Dr. Fabricant pointed out, adding:

"By imitating his parents, a young child may quickly grasp the excuse value of headache as a means of escaping from an undesirable or unpleasant task."

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Medical Society of Virginia Cancer Committee

Chairman, George Cooper, Jr., M. D.

Albemarle Hotel Building, Charlottesville, Va.

Reprints of this and preceding Bulletins may be obtained from this office

JULY 1, 1953

Case Reports

Case I. Six years ago, a 43 year old woman who was going through the menopause noticed intermenstrual spotting. She at once sought the advice of her family physician. He did a pelvic examination and found a small, shallow cervical erosion. He took a biopsy which was reported "epidermoid carcinoma of the cervix, grade 3." There was no evidence of extension beyond the cervix. Roentgen and radium therapy were given promptly. Today this patient is alive and well with no evidence of recurrent or metastatic tumor.

Case II. A sixty year old woman, nine years postmenopausal, noticed a trace of blood tinged vaginal discharge. She at once sought the advice of her family physician. He did a pelvic examination and found a small, shallow cervical erosion. The woman inquired about the possibility of cancer. The doctor told her that the ulcer had none of the characteristics of cancer, that therefore she assuredly did not have cancer, and he then cauterized the ulcer. Four months later there was a little more spotting. This time, the patient consulted another physician. On pelvic examination, he found that the ulcer had either persisted or recurred. He took a biopsy which was reported "epidermoid carcinoma of the cervix, grade 2." There was still no evidence of extension beyond the cervix. Roentgen and radium therapy were given promptly, and the patient has a very hopeful prognosis.

Comment: 1. Postmenopausal bleeding should be considered as presumptive evidence of cervical or endometrial carcinoma. These possibilities must be ruled out before treatment is planned.

2. Cervical lesions should not be cauterized until malignancy has been ruled out by satisfactory biopsy. Pathological study of *adequate* biopsy material is the only way to rule out or diagnose carcinoma. Inspection and palpation are completely unreliable. When the source of bleeding is above the cervix, dilatation and curettage should be performed to obtain endometrial specimens for pathological study. Persistent lesions should be re-biopsied, even though the first specimen is reported benign. Whenever the pathologist is in doubt about a specimen, he should be promptly supplied with additional tissue.

3. With the establishment of the pathological service of the Division of Cancer Control, State Health Department, there is no practical or economic reason to omit biopsy. The service is available to every physician in the State for any of his patients.

4. In Case II, cauterization of the cervical erosion without biopsy was wrong handling. The first physician failed to make the diagnosis, gave his patient incorrect treatment and advice, and caused a four months' delay in the discovery and treatment of a cervical carcinoma — all because he failed to take a biopsy.

Case I illustrates the happy result when both patient and physician act promptly and intelligently.

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PUBLIC HEALTH

MACK I. SHANHOLTZ, M.D.,
State Health Commissioner of Virginia

Psittacosis.

With the report of a case of psittacosis, the first since 1949 in Virginia, our attention is again directed to this disease, sometimes called ornithosis.

The etiological agent is a specific virus which passes through only rather coarse filters. The source of the infection is usually some one of the psittacine birds, parrots, parakeets, love birds, etc., but it has also been found in canaries, pigeons, ducks, and turkeys. Infection of human beings occurs by inhalation of infected dried materials in the form of dust or from droplets coughed by infected patients. Birds that are apparently well occasionally transmit the infection. The incubation period is from 6 to 15 days, with an average of about 10 days.

The findings of a Board appointed in 1950 by the Surgeon General of the Public Health Service were that psittacosis is no longer a major public health problem in the United States; that it has a much wider reservoir than the birds of the psittacine family and that the development of the antibiotic drugs has reduced the mortality of this disease to a very low level. Because the disease is no longer a major public health problem does not mean that we should have little concern for it.

Foreign Quarantine Regulations and Interstate Quarantine Regulations of the Public Health Service mainly control the traffic in psittacine birds and certain states have adopted regulations governing these birds. Shipments of psittacine birds from psittacosis-free areas in the United States is permitted. Whenever the Surgeon General of the Public Health Service finds that psittacine birds or human beings in any area are infected with psittacosis and there is such danger of transmission of the disease from this area as to endanger the public health, he may declare it an area of infection and prohibit shipment of the birds from the area. None of the regulations of the Public Health Service affects the standing requirement that interstate shipments of psittacine birds must be covered by a permit when it is required by the health department of the state of destination.

Because infections are comparatively infrequent, it is important to remember this disease in illnesses that do not present a clean-cut diagnosis but present respiratory involvement. The history of exposure to birds is most important. Blood for complement fixation tests should be taken as early as possible in the course of the disease and again later for comparison in rise of titre. If suspected birds have not died they should be killed. The bodies of these birds should be wet with 5% lysol solution and they should be wrapped in cloths soaked in the solution. They should then be quick frozen and Air Expressed in dry ice to the proper laboratory for examination and diagnosis of the disease. The State Health Department should be informed and complete directions for mailing will be supplied on notification.

Early treatment of the patient with appropriate antibiotics is indicated and is desirable not only from the standpoint of treating the patient, but also as a means of shortening the period of communicability of the disease.

MONTHLY REPORT OF THE BUREAU OF COMMUNICABLE DISEASE CONTROL.

	May 1953	May 1952	Jan.-May 1953	Jan.-May 1952
Brucellosis	4	2	20	9
Diarrhea & Dysentery	56	27	397	1042
Diphtheria	3	8	48	44
Hepatitis	345	57	1097	303
Measles	1252	3392	3573	12949
Meningitis	17	28	120	110
Poliomyelitis	9	0	19	11
Rocky Mt. spotted fever	6	6	8	9
Scarlet fever	116	71	580	452
Tularemia	1	4	15	26
Typhoid and Paratyphoid	5	3	21	21
Rabies in Animals	41	48	234	271

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MENTAL HEALTH

JOSEPH E. BARRETT, M.D.,
Commissioner, Department Mental Hygiene and Hospitals

The Mental Hygiene Clinic and Community Relationships.*

A Mental Hygiene Clinic has been considered in some detail in previous articles submitted in this Journal. Its origins, its component parts of Psychiatrist, Social Worker, and Psychologist making up the team and the types of problems it seeks to solve have been presented.

Another aspect of clinic functioning that needs further clarification is the role a community plays in a clinic and the role a clinic plays in a community.

A Mental Hygiene Clinic is designed to serve the individual in the community.

Stanley I. Gochman states:

" . . . It is important that the patient comes to feel that he has some connection and concern with the community and the outside world, and it is just as important that the community comes to recognize the patient as an individual and a member of society, and recognizes its responsibilities toward him."

The latter part of the above paragraph may be considered the basis for this article. A community's interest in the individual is obvious in that a mental hygiene clinic is in part community financed. A clinic is not selective of those it seeks to help. Any person in a community may seek its help. Many individuals who are aware that they need help will spontaneously seek clinic help. Others seek help from either private physicians or community agencies. It is through the discernment of doctors and agency workers of a deeper psychic problem being present that the patient is referred to a clinic for study and treatment. A cooperative spirit between a clinic and community must be maintained if the individual is to be helped.

Schools are a part of a community that frequently seek clinic guidance. One type of problem that schools frequently refer to the clinic is a child who does not seem to be adjusting well in school work. The marks are low. There is inattention and restlessness. After clinic examination, it is often revealed that the I.Q. is low, and therefore, a child is not capable of doing average school work. The clinic then must suggest the best way to handle this problem. In some cases it is felt that a child should be taken out of school and have a private instructor, if possible. In other cases a special private school might be suggested, if there are sufficient financial resources in the family. In still other cases, if the situation warrants, he could be sent to the state training school. Occasionally also, a child might adjust better if he were sent to a lower grade.

Another type of school referral is a child who is a behavior problem. Truancy, belligerency and open defiance are the symptoms often seen. Through a complete clinic work-up it may be found that there is a basic emotional need, such as affection, which a child has not been getting or that there is incompatability between the child's parents. Sometimes it is found that this behavior disturbance is deep-seated and a child has been a problem almost since infancy. A clinic tries to work through personal and interpersonal conscious and unconscious problems and tries to relate them to the environmental situation as well as to the school situation. Conferences between the school, the therapist team, and the parents of the child should be held in such cases. Parents and schools will approach the situation from different points of view. A therapist tries to adjust the individual to the environment and in doing so it necessarily has to be permissive. Often, when ideas are opposed, it is necessary to some extent to compromise. A clinic needs school cooperation in requesting certain types of school placement for certain problem children.

School and other problems may be caused by speech disorders. Some speech disorders have the background of mental deficiency. It is important for the speech therapist to know this so a child is referred to the clinic for psychological testing. At other times there seems to be an emotional disturbance and, of course, it is important that a clinic be contacted to go into this in its full detail, as well as to institute therapy at a clinic level and it is necessary to in-

*Article prepared by Wendell J. Pile, M.D., Director, Lower Peninsula Mental Hygiene Clinic, Newport News, Virginia.

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tegrate these functions by having conferences between a speech therapist and a clinic therapist.

Other agencies also contribute referrals, such as, family counseling agencies. In their counseling they often feel a deep-rooted neurosis is present that may need resolving before the family can function happily as a unit. The problem also may be presented to a clinic by one party coming to the clinic because of an emotional disturbance in which he blames the emotional disturbance upon his marriage partner. If there is complete cooperation between the marriage partner and the patient, it is possible to work with them individually at a clinic, and it is also possible to refer one of the partners to a family counseling agency. Conferences are again mandatory and it is necessary often to see husband and wife together with a family counseling representative and a clinic therapist. Suspiciousness and misunderstandings can frequently be erased through frank discussion by all present.

Another field of community problem involves the courts and clinics. Cases in which the judge feels there is an emotional component are often referred to a clinic for observation and findings and frequently for subsequent treatment. In such a case a clinic feels its responsibilities not only to the court, but also to the individual. It is true where court cases are referred for psychiatric treatment, that there must be a willingness on the part of the person to accept psychiatric care. If he doesn't have that willingness, therapy is not always successful.

A Clinic also helps in assaying the intelligence of children who are up for adoptive placement. Here the cooperation is between a welfare agency and a clinic. A clinic is frequently asked to determine the mental capabilities and potentialities of those asking for state assistance. Whenever indicated, treatment is instituted which may result in the person becoming self-sufficient.

A clinic also needs the cooperation of other agencies in its treatment of all facets of the patient's personality. Socialization of certain individuals is mandatory. The Boy Scouts, Girl Scouts, Y.M.C.A., Y.W.C.A. and clubs of all kinds play a part in this aspect of treatment. A clinic strives for the individual to accept the group (in certain cases) and the group assumes its role by accepting the individual.

An attempt has been made to show the inter-relationships of a mental hygiene clinic with a community. It is self-evident that only through team spirit and a feeling of cooperation between referring agencies and a clinic, can an individual assume his rightful independence and social maturity.

If Good Public Relations Begin at Home
What does your reception room look like?

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THE MEDICAL SOCIETY OF VIRGINIA

Polio Committee Report

Distribution of Gamma Globulin for Poliomyelitis.

The Polio Committee of The Medical Society of Virginia met in the Conference Room of the State Department of Health to advise with them concerning the use and distribution of gamma globulin.

It was felt that the use of gamma globulin is the best means we have to protect against poliomyelitis. It is not exactly what is desired, for gamma globulin will have to be given to a large group of contacts in order to prevent effectively poliomyelitis in one who may develop the disease when exposed. This was the experience of those who used gamma globulin last year in attempting to prevent poliomyelitis. The supply of gamma globulin is to be distributed to the various states.

Since the entire amount of gamma globulin available to Virginia is to be sent to the State Department of Health, the following plan of distribution has been established:

1. All gamma globulin will be allocated to the City and County Health Departments on a population basis.
2. *Eligibility:*
   a. Those children from 6 months to 15 years of age who are household contacts of confirmed cases of poliomyelitis. (Household contacts will include those living in the same house with common bathroom and table facilities.)
   b. All cases of pregnancy who are household contacts as described above.
3. Requests for gamma globulin may be made by physicians to Directors of City or County Health Departments on forms supplied to those offices.
4. The gamma globulin which has been assigned for the protection against measles and infectious hepatitis is not to be used for the protection against poliomyelitis.

These request forms for gamma globulin are to be filled out by the physician stating the names of the contacts, their ages and weights and to what case of poliomyelitis they were exposed. The approximate dosage will be recommended on the request slip.

With more than 1,000,000 children coming within the age group and a supply of gamma globulin available for approximately 3,000 contacts, the necessity for wise use of material is evident.

It is recommended by the Commiteee that the physicians of Virginia take advantage of this means of protection against poliomyelitis by cooperating with the State Health Department.

POLIO COMMITTEE OF THE MEDICAL SOCIETY OF VIRGINIA

LEE E. SUTTON, JR., M.D., *Chairman*, Richmond

R. B. BOWLES, M.D., Mathews

E. A. HARPER, M.D., Lynchburg

ROBERT C. HOOD, M.D., Arlington

ROY M. HOOVER, M.D., Roanoke

ALBERT S. MCCOWN, M.D., Richmond

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WOMAN'S AUXILIARY TO THE MEDICAL SOCIETY OF VIRGINIA

President—
MRS. THOMAS N. HUNNICUTT, JR., Newport News
President-Elect—MRS. K. W. HOWARD, Portsmouth
Treasurer—MRS. WM. C. BARR, Richmond
Recording Secretary—MRS. LEE S. LIGGAN, Irvington
Corresponding Secretary—
MRS. F. A. CARMINES, Newport News
Publication Chairman—
MRS. ROBERT H. DETWILER, Arlington

Nurse Recruitment

The Woman's Auxiliary to the Alexandria Medical Society has again sponsored a Girl Scout Troop this year and Mrs. James Moriarty has accompanied 24 Scouts on two trips, one to the University Hospital in Charlottesville and another to the Tuberculosis Sanitarium at Glendale, Md. Both trips were, primarily, to further the interest in a nursing or public health career. Of the four Scouts who were interviewed at Charlottesville, two were accepted for enrollment in the autumn class. The Auxiliary feels that they are responsible for recruiting at least four student nurses this year. They maintain a scholarship fund for the use of eligible students interested in a nursing education at Alexandria Hospital.

New Officers and Committee Chairmen.

The Richmond Auxiliary held its last meeting on May the 15th at which time the following officers were elected:

President—Mrs. Custis L. Coleman
President-Elect—Mrs. J. R. Grinels
Vice President—Mrs. George H. Snead
Treasurer—Mrs. Carl Meador
Corresponding Secretary—Mrs. William H. Cox
Assistant Corresponding Secretary—Mrs. George D. Vaughan, Jr.
Recording Secretary—Mrs. William C. Barr
Historian—Mrs. Gilman R. Tyler
Parliamentarian—Mrs. J. David Markham

The president appointed the following committee chairmen:

STANDING COMMITTEE CHAIRMEN:
Editorial—Mrs. J. R. Grinels
Today's Health—Mrs. Albert L. Edmonds
Bulletin—Mrs. M. J. Hoover, Jr.
Legislative—Mrs. L. W. Hulley, Jr.
Membership—Mrs. Maynard Emlaw
Program—Mrs. George H. Snead
Public Relations—Mrs. William Harris and Mrs. Randolph Hoge
Revisions—Mrs. Edward Ray and Mrs. L. Benjamin Sheppard

SPECIAL COMMITTEE CHAIRMEN
Civil Defense—Mrs. Frederick L. Finch
Devotional—Mrs. Hawes Campbell
Doctor's Day—Mrs. Russell Snead
Flowers—Mrs. George K. Brooks, Jr.
Luncheon—Mrs. Wyndham Blanton, Jr.
Co-Chairman—Mrs. A. A. Houser
Nurse Recruitment—Mrs. Walter H. Buffey
Personal Relations—Mrs. C. C. Trice
Romance and Research—Mrs. George Ritchie
Telephone—Mrs. Charles Romaine
Volunteer Work—Mrs. G. Douglas Hayden
Ways and Means—Mrs. W. P. Morrissette
Year Book—Mrs. Berkeley H. Martin, Jr.

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EDITORIAL

Walter B. Martin, President-Elect A. M. A.

THE first President of the American Medical Association was Nathaniel Chapman, a Virginian who had succeeded Benjamin Rush in Philadelphia as leader in the profession. Few Virginians, scarcely more than a half-dozen, have been elected to this high office since and of these only three were elected from The Medical Society of Virginia. Dr. Walter Bierring in his "Biographies of the Presidents of the American Medical Association 1847-1947" gives us a composite picture of these presidents. Their average age was 59.8 years. Almost all were at some time a teacher. All took part in one or more wars and there has been no war in which this country has engaged, including the war of 1812, in which one or more of these doctors did not participate. Forty-six were classed as general surgeons, twenty-two were internists, eight were general practitioners, six were obstetricians. There were two psychiatrists and two ophthalmologists, and one each in the following specialty; orthopedics, pathology, pediatrics, dermatology, biochemistry, otology, gastro-enterology, urology, and administration. For the first seventy-five years the presidents were apparently chosen for their outstanding professional reputation. More recently emphasis has shifted to ability to further social welfare. Our new President-Elect qualifies by either standard.

Walter Bramblette Martin was born January 16, 1888 in Pulaski, Virginia. He graduated with a B.S. degree (1909) from Virginia Polytechnic Institute. He taught chemistry and mathematics at the Norfolk Academy from 1909 to 1912 when he began the study of medicine at Johns Hopkins, graduating in 1916; served as resident house officer Johns Hopkins Hospital until the first World War; was commissioned 1st Lieutenant April 1917; served in France and was discharged with the rank of Captain June 15, 1919. In September he entered the practice of medicine in Norfolk, Virginia, where he quickly became not only a leading doctor but a leading citizen. He was president of the Community Fund for two years, president of the Norfolk Hospital Association and vice-president of the Tidewater Hospital Service Association. In the second World War he re-entered the Army and served as colonel U.S.M.C. chief of medicine, Percy Jones Hospital, Battle Creek, Michigan, September 1942 to September 1943; medical consultant Fifth Service Command, July 1944; medical consultant 10th Army, and civilian medical consultant to Surgeon General of the Army.

He is a diplomate of the American Board of Internal Medicine and since 1944 a member of the Board of Regents of the American College of Physicians. Among his other special societies are; the American Clinical and Climatological Association, the Association for the study of Allergy and the American Association for the Study of Rheumatism.

His record in organized medicine is an impressive one. On the local level he has been president of the Norfolk County Medical Society and of the Seaboard Medical Association. He was president of The Medical Society of Virginia in 1941. For years he has been a member of its House of Delegates and of its Council. No committee assignment has been too arduous or time-consuming for him, and his efficiency has been so great that these assignments have been numerous.

Dr. Martin's activities in the American Medical Association have been equally noteworthy. He has been a member of the House of Delegates, the Council on Medical Service, the Commission which went to England in 1950 to study the effect of the National Health Program, and the Board of Trustees. In fact in the past few years

most of his time has been spent traveling back and forth to the headquarters in Chicago and before Congressional hearings in Washington. No President-Elect has had a more intensive training for his position, and the Virginia Medical Monthly wishes him all success.

Cox's Snow

COX'S snow is a tradition on the Southside. At the beginning of the century old folk were still talking about the great blizzard that cost Dr. Edwin Cox his life. It was, and still is, the greatest snow storm that has ever visited the neighborhood within the memory of man. No big snow escaped a comparison with it. Just last year, in a feature article in the *Richmond News Leader,* George W. Rogers called it "the dean of snows in Richmond". The snow fell January 18 and 19, 1857, and was two or three feet deep with drifts of six to eight feet and the weather was bitter cold. On January 22nd the temperature was three degrees below zero and on January 23rd it was 18 degrees below.

On Sunday afternoon, January 18th Dr. Cox accompanied by his nephew, Mr. Robert C. Traylor, left Petersburg in the face of a raging snow storm to drive to his home in Chesterfield. Night overtook them when they reached the home of Dr. Robert Grymes, Dr. Cox's son-in-law. Dr. Grymes begged them to spend the night but they decided to push on over a familiar short cut to their destination. They had gone only a short distance when the buggy struck a hidden log and the singletree was broken. Dr. Cox got out and was entrapped in a snow drift where he was found the next morning frozen to death. Young Traylor was found in the buggy, his face, hands, and feet frozen, and he never regained consciousness. According to a note in the *Dale Parish Register* by the Rev. A. Blizzard, Dr. Cox was buried at his plantation "Sappony" in Chesterfield, January 23, 1857.

Such are the main events of the catastrophe. A number of accounts have come down to us. (A) The news account in the *Daily Dispatch* of January 22, 1857. This was three days late because of the disruption in communication caused by the storm; (B) Abstracts from the unpublished History of Chesterfield County by Judge Edwin P. Cox kindly furnished the writer by his son Col. Edwin Cox; (C) My Confederate Girlhood by Kate Virginia Cox Logan (1932); (D) Seventy Years in Old Virginia by Dr. John Herbert Claiborne (1904); (E) Historic Sights and People of Chesterfield County, Virginia by Mrs. Maud Adkins Joyner (1950); (F) George W. Rogers in *The Richmond News Leader,* January 29, 1952.

According to tradition, the purpose of the trip was to see a patient. His "Aunt Kate" (C) says that he had been to Petersburg to visit a patient and was returning home. No other printed account mentions a patient. The History of Chesterfield County (B) also says that Dr. Cox was returning home when overtaken by dark. (A), (D), (E) and (F) say that Dr. Cox was on his way to visit his brother, Judge James Cox. Two accounts (B) and (C) state that the horse was frozen.

Dr. Joseph Edwin Cox was the eldest son of Captain Henry Cox of Sappony in Chesterfield and his wife Mary Traylor. The other children of this marriage who reached maturity were: James Henry (later Judge), Minerva Archer who married Daniel Spencer Woolridge, Judith Elizabeth Chappell who married James Howlett, and Mary M. M. who married Joseph Mann. He was born at Sappony, October 10, 1806, and was educated at home and at Jefferson Medical School in Philadelphia.

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He began to practice in the southwestern part of Chesterfield, but soon moved to Petersburg where he built up an excellent practice. At one time he was the vice-president of the Medical Faculty, as the doctors called their local society. He represented the City of Petersburg in the General Assembly and was at one time Mayor of Petersburg.

He married Sarah M. Burge and they had the following children: Mary Page who married Dr. Robert R. Grymes, Joseph Edwin who married Ella Cooper, and Henry Cargill who married Emma, the widow of his cousin, James Paper Cox. At the time of his tragic death he was living at Sappony having retired from practice in Petersburg.

How medicine has changed in the 97 years since Dr. Cox practiced the art in Petersburg! There were no hospitals and no laboratories. Practice, even surgery, was confined to the patient's home. Anesthesia was in its infancy and the American Medical Association had a standing committee on anesthesia that gave a report on its progress each year. Nearly all obstetrics was in the hands of midwives and maternal mortality was high—how high we do not know for there were no vital statistics. Birth trauma must have been common but for the most part was untreated. Dr. Peter Mettauer, who lived in nearby Prince Edward County, reported on five cures of vesico-vaginal fistulas in 1847 and by 1855 he had seen 32 cases, but it was not until Marion Sims reported on his method of operation in 1852 that this became an accepted practice. Even lacerations of the perineum went unrepaired. Mettauer's report of a successful repair in 1833 with metallic sutures led Sir James Y. Simpson to attempt the operation. Puerperal fever was the only continued fever that was differentiated from the other "continued" fevers that were so prevalent. Dysentery and intestinal diseases prevailed generally. Vaccination against smallpox offered the only opportunity for preventive medicine, and quinine for fever, mercury and iodide for syphilis, and iron for anemia were the nearest approach to specific treatment.

To compensate for their limited therapeutic resources, Dr. Cox and his colleagues were filled with sympathetic understanding and brought comfort to their patients. They responded when called, regardless of weather or hardships, and their patients had the best help that current medical knowledge afforded. The legend of Dr. Cox's being lost while on a mission of mercy in a record breaking blizzard is thoroughly *in character.*

SOCIETIES

The Medical Association of the Valley of Virginia

Met at Sharon Tavern near Clifton Forge on May 28, Dr. Lewis K. Woodward, Jr., Woodstock, presiding. At the morning session, there were reports of clinical cases and the following papers:

Carcinoma of Cervical Stump with Solitary Lung Metastasis—Dr. Richard Hughes, Winchester

Combined Intrauterine and Tubal Pregnancy—Dr. Thomas G. Bell, Staunton

Parotid Tumor—Drs. Randolph T. Shields and Karl Menk, Staunton

Genital Anomalies by Dr. Howard Mays, guest speaker of Baltimore.

Following lunch, Dr. John M. Emmett of Clifton Forge gave Comments on the Military Status and Availability of Physicians.

At a business session it was decided that the next meeting would be at Harrisonburg on September 24, with Dr. Murray Copeland, the guest speaker.

His subject will be "Pre-Malignant Lesions of the Breast".

The Warwick-Newport News Medical Society

Has had interesting meetings for the past several months, following a social hour and dinner. The March meeting was held at the James River Country

Club with Dr. Norman F. Conant of Duke Hospital, Durham, as the guest speaker, his subject being "Recent Advances in Treatment of Fungus Diseases".

At the April meeting at Chamberlin Hotel, Dr. W. Ross Southward, Jr., of the State Health Department, Richmond, spoke on "The Role of the Doctor in Civilian Defense".

Dr. Milton S. Sacks, Professor of Hematology and Laboratory Medicine at the University of Maryland, Baltimore, May 12, at James River Country Club, spoke on recent studies and significance of the Rh factor.

Dr. O. Watts Booth and Dr. W. Ward Anderson, both of Newport News, are president and secretary, respectively.

Accomac County Medical Society.

At a meeting of this Society at Onancock, May 6, the following officers were elected: President, Dr. Belle DeCormis Fears, Accomac; vice-president, Dr. William Clay Fritz, Onancock; and secretary-treasurer, Dr. James C. Doughty (re-elected), Onancock. Delegate and alternate to the State Society meeting were also elected. Dr. Walter A. Eskridge of Parksley was named to represent the Society on Public Relations, and Dr. J. Fred Edmonds and Dr. Belle DeCormis Fears of Accomac were elected to membership on the Board of Trustees of the Northampton-Accomac Memorial Hospital for a term of four years.

Alexandria Medical Society.

At the meeting of this Society on May 21, the new officers for 1953-1954 were installed as follows: President, Dr. John C. Watson; vice-president, Dr. Christopher J. Murphy, Jr.; and secretary-treasurer, Dr. Alvin C. Wyman. All are of Alexandria.

The Fairfax County Medical Society

Met on Tuesday, May 12th, at the home of Dr. Emanuel Newman at Falls Church. After the business session, Dr. W. S. Matthews, a Navy physician, spoke on medical practice in Greece. The meeting was held outdoors, and later adjourned for refreshments.

The June meeting of this Society was held on the 9th of the month at the home of Dr. Claude Cooper at Annandale.

ALICE KIESSLING, M.D.
Publicity Committee.

The Albemarle County Medical Society

Held a supper meeting at Hotel Albemarle in Charlcttesville, on June 4th. Dr. David Lucas was the speaker at this meeting, his subject being "Blood Dyscrasias Due to Drugs". Dr. E. D. Davis of Crozet is president of the society and Dr. A. P. Booker of Charlottesville secretary.

Roanoke Academy of Medicine.

The following have been elected as officers of the Academy for the coming year, and will be installed on October 5: Dr. C. D. Nofsinger, President; Dr. Allen Barker, President Elect; Dr. Hugh J. Hagan, Sr., Vice-President; and Dr. Charles B. Bray, Jr., Secretary-Treasurer. All are of Roanoke.

Augusta County Medical Association.

At the meeting of this society in May, Dr. S. G. Saunders of Waynesboro was elected president, succeeding Dr. C. W. Putney of Staunton. Others named to serve with Dr. Saunders are: Vice-presidents, Dr. William Lueders, Jr., Staunton; Dr. C. C. Freed, Waynesboro; and Dr. I. M. Nuckols, Staunton; secretary, Dr. John T. Obenschain, Waynesboro; treasurer, Dr. William E. Harman. Dr. C. W. Putney was named a censor.

Hopewell City Medical Association.

New officers of the Hopewell society are Dr. Clyde H. Dougherty, President, and secretary Dr. W. P. Youngblood, both of Hopewell.

Virginia Peninsula Academy of Medicine.

Addressing the Academy at its May meeting was Dr. Stuart C. Finch, Associate Professor of Medicine, Boston University Medical School, Boston, Mass. The meeting was held May 18 at the Kecoughtan Veterans Administration Hospital, Hampton, following a cocktail party and dinner. Dr. Finch conducted a clinico-pathological conference on three cases involving blood disease. Dr. Edgar Baron, Pathologist of the Kecoughtan Hospital, also participated.

New officers of the Academy were elected. Dr. Chester D. Bradley, Newport News succeeded Dr. Barnes Gillespie of Warwick as President; Dr. Harry Nushan, Chief, Medical Service, Kecoughtan Hospital, succeeded Dr. Oscar W. Ward, Jr., of Hampton as Vice-President; and Dr. William Watkins, Newport News, replaced Dr. George S. Grier, III, of Newport News as Secretary-Treasurer.

The Academy then recessed till next September.

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NEWS

Commencements of Medical Schools.

MEDICAL COLLEGE OF VIRGINIA

Entertainments incident to the commencement, with alumni meetings and banquet, were held May 31, June 1 and 2. Dr. Theodore F. Adams gave the commencement sermon at the First Baptist Church on May 31, and alumni and other affairs kept the graduates and visitors busy. The alumni association, which had been headed by Dr. H. Hudnall Ware of Richmond, installed the new officers as listed on pages 298-9 of the May issue of the MONTHLY, with Dr. J. Asa Shield of Richmond succeeding to the presidency.

Preceding the final reception and dance, honorary degrees were conferred upon three of the medical alumni—Dr. Jack W. Witten, physician and legislator of North Tazewell; Colonel Richard Henry Eanes, M.C., chief medical officer of the Selective Service System; and Dr. Richard Hugh Wood, dean of Emory University School of Medicine—and diplomas were awarded to one hundred graduates in medicine and to many more in dentistry, pharmacy, nursing, physical therapy, hospital administration and other specialties. Names of the graduates in medicine with their hospital appointments are:

MEDICAL COLLEGE OF VIRGINIA HOSPITALS, Richmond—Drs. Charles Lee Boatwright, Marion; Dominic Anthony Brancazio, Weirton, W. Va.; George Edward Chappell, Crewe; Robert Edward DeBord, Chatham Hill; Ota Treville Graham, Jr., Richmond; Robert Oscar Hudgens, Lynchburg; Raymond Jack Irons, Ronceverte, W. Va.; Arch Thomas McCoy, II, Peterstown, W. Va.; Leroy Sutter McDaniel, Ettrick; Philip Royden Mason, Norfolk; George Naymick, Weirton, W. Va.; Alger Rixey Southall, Jr., Pamplin; Thomas Pierson Stratford, Burlington, N. C.; James Hugh Wiley, Logan, W. Va.; Allan William Wright, Norfolk.

STUART CIRCLE HOSPITAL, Richmond — Drs. Charles Pinchbeck Harwood, Richmond; Earnest Conrad Hermann, Richmond; Farrar Wakefield Howard, Richmond; Norman Clydlee Ratliffe, Clintwood.

JOHNSTON-WILLIS HOSPITAL, Richmond — Dr. Wilmore Randolph McLeod, Glen Allen.

JOHNSTON MEMORIAL HOSPITAL, Abingdon—Dr. Robert Francis Barbe, Bristol.

U.S. NAVAL HOSPITAL, Portsmouth—Drs. Dudley Earl Brown, Jr., Berryville; William Paul Fletcher, Harrisonburg; Raymond Cottrell Hooker, Jr., Richmond; Arthur McKinley Reynolds, Jr., Covington.

LEWIS-GALE HOSPITAL, Roanoke—Drs. Herman Wallace Brubaker, Rocky Mount; Alvin Eugene Conner, Manassas; Harry Isaac Johnson, Jr., Salem; Moir Glenwood Martin, Hillsville.

RIVERSIDE HOSPITAL, Newport News—Drs. Kenneth Melvin Clements, Portsmouth; Cecil Franklin Evans, Jr., Richmond.

WINCHESTER MEMORIAL HOSPITAL, Winchester—Dr. Catherine Elizabeth Craun, Mt. Crawford.

NORFOLK GENERAL HOSPITAL, Norfolk—Drs. Calvin Sampson Garrett, Madison Heights; William Neville Gee, Jr., Kenbridge; Warren Cleaton Hagood, Clover; Frank Edward Rowell, Salem; Charles Gerhard Thedieck, Jr., Suffolk.

U. S. PUBLIC SERVICE HOSPITALS, Norfolk—Dr. Allen Chapman Pirkle, Prince George.

NORTH CAROLINA MEMORIAL HOSPITAL, Chapel Hill, N.C.—Drs. Simeon Huey Adams, Gastonia, N.C.; George Lee Wilkinson, South Boston.

DUKE HOSPITAL, Durham, N.C.—Dr. Baxter Hayes Byerly, Lenoir, N. C.

THE MOSES H. CONE MEMORIAL HOSPITAL, Greensboro, N.C.—Dr. Jean Fensom Ragsdale, Richmond.

CINCINNATI GENERAL HOSPITAL, Cinncinnati, Ohio—Drs. James Gordon Beach, Jr., Gary, W. Va.; Mary Dorcas Brown, Buckhannon, W. Va.; William Raymond Johnson, Jr., Mt. Sidney; Arthur Sanders, Charleston, W. Va.; Raymond Jay Thabet, Charleston, W. Va.

MERCY HOSPITAL, Springfield, Ohio—Drs. Wesley Clifford Bernhart, Richmond; Harvey Edward Melton, Richmond; Samuel Stuart Morrison, Sandston; Charles James Townsend, Harrington, Del.; Woodrow Wilson Wren, Richmond; Mattie Louise Young, Charleston, W. Va.

SPRINGFIELD CITY HOSPITAL, Springfield, Ohio—Drs. Frank Vernon Hodges, Bluefield, W. Va.; Ralph Lee Kendall, Springfield, O.

HAWKES HOSPITAL OF MT. CARMEL, Columbus, Ohio—Drs. Robert Winfield Howes, Jr., Parkersburg, W. Va.; George Eugene McCarty, Salem, W. Va.

UNIVERSITY HOSPITALS, Cleveland, Ohio—Dr. James Edward Moore, III, Huntington, W. Va.

OHIO STATE UNIVERSITY HOSPITAL, Columbus, Ohio—Dr. Ross Moore Orr, Jr., Chatham Hill.

MID-STATE BAPTIST HOSPITAL, Nashville, Tenn. —Drs. Hoyle Edgar Bowman, Newport News; Richard Holloday Smith, Radford.

CITY HOSPITAL, San Juan, P.R.—Dr. Carmen Margarita Caceres-Echandi, Juncos, P.R.

WESLEY MEMORIAL HOSPITAL, Chicago, Ill.—Dr. Lillian Chan, Canton, China.

UNIVERSITY OF ILLINOIS RESEARCH AND EDUCATIONAL HOSPITAL, Chicago, Ill.—Dr. Julie Clara Moller, Caracas, Venezuela.

CHARLESTON GENERAL HOSPITAL, Charleston, W. Va.—Drs. Donald Edward Cunningham, St. Albans, W. Va.; Charles Joseph Davis, Jr., Nitro, W. Va.; John Rebman, III, Richmond.

BROOKE ARMY MEDICAL CENTER, San Antonio, Texas—Dr. Pleasant Paul Deaton, Statesville, N.C.

SAN FRANCISCO HOSPITAL, San Francisco, Calif. —Dr. Mary Catherine Duckgeischel, Santa Clara, Calif.

LOS ANGELES COUNTY HOSPITAL, Los Angeles, Calif.—Dr. Julius Griffin, Los Angeles, Calif.

U.S. NAVAL HOSPITAL, San Diego, Calif.—Dr. Verbon Eric Kemp, Jr., Richmond.

U.S. NAVAL HOSPITAL, Philadelphia, Pa.—Dr. Ernest Gray Edwards, Hampton.

PRESBYTERIAN HOSPITAL, Philadelphia, Pa.—Dr. William Ned Haynes, Welch, W. Va.

PHILADELPHIA GENERAL HOSPITAL, Philadelphia, Pa.—Drs. Edward Claiborne Irby, Blackstone; Alvin Quarles Jarrett, Roanoke; George Bernard Massie, Pounding Mill; William Burwell Tarry, Jr., Brookneal; John William Watson, Richmond; William Greene Way, Winchester.

GREENVILLE GENERAL HOSPITAL, Greenville, S.C. —Dr. Hugh Lanier Farrior, Concord, N.C.

U.S. NAVAL HOSPITAL, Charleston, S.C.—Dr. William Latane Flanagan, Bremo Bluff.

ROPER HOSPITAL, Charleston, S. C.—Dr. Max Sanford Rittenbury, Charlotte, N. C.

MONTREAL GENERAL HOSPITAL, Montreal, Canada—Dr. Allan Louis Forbes, Richmond.

MOUND PARK HOSPITAL, St. Petersburg, Fla.— Drs. Earl Russell Fox, Naruna; Charles Wellington Richardson, Salem; Walter Jackson Stanford, Galax; Paul Alexander Tanner, Jr., and Terry Finley Tanner, Quitman, Ga.

ORANGE MEMORIAL HOSPITAL, Orlando, Fla.— Dr. John Calver Shipper, Martinsburg, W. Va.

FITZSIMONS ARMY HOSPITAL, Denver, Colo.—Dr. Joseph Erskin Gardner, Hillsville.

UNIVERSITY HOSPITAL, Augusta, Ga.—Drs. Frederick True Given, Jr., Chase City; Harold Winfred Kimmerling, Roanoke; Robert Melvin McDonald, Oak Hill, W. Va.

UNIVERSITY OF TEXAS HOSPITALS, Galveston, Tex.—Dr. Robert Burwell Groves, Jr., Lowell, N.C.

BELLEVUE HOSPITAL, Second Medical Division, New York, N. Y.—Dr. Lawrence Charles Rosenberg, Alexandria.

MASSACHUSETTS MEMORIAL HOSPITAL, Boston, Mass.—Dr. Malcolm Lee Rosenblatt, Norfolk.

WORCESTER CITY HOSPITAL, Worcester, Mass. —Dr. Robert Edward Ware, Fairfax.

CENTRAL DISPENSARY AND EMERGENCY HOSPITAL, Washington, D. C.—Dr. Henry Sumpter Spencer, Jonesville.

ARMY MEDICAL CENTER, Washington, D. C.—Dr. Thomas Harry Webb, Portsmouth.

Dr. Thomas James Conaty of Huntington, W. Va., was also a member of this class with no hospital appointment given.

UNIVERSITY OF VIRGINIA SCHOOL OF MEDICINE

Finals at the University of Virginia for all departments started on June 12, the alumni playing an important part in the exercises. There was a special program for the medical school graduates on Friday the 12th. The alumni played golf in the afternoon and class dinners were held that night. At a scientific program in the morning, Dr. Robert L. King, class of '28, of Seattle, Wash., gave an address on "Rheumatic Fever and Heart Disease", which was followed by reports of medical studies in progress at the University by members of the faculty. At a luncheon that day Dr. Thomas H. Hunter, who assumed the deanship of the Medical School in February, outlined future plans and policies. Dr. Carrington William of Richmond, president of the Medical Alumni Association, was the dinner speaker. Governor Battle, an alumnus of the law class of 1913, delivered an address to the graduates following the conferring of degrees on Monday afternoon. Names of graduates in the School of Medicine with hospital appointments are:

UNIVERSITY OF VIRGINIA HOSPITAL, Charlottesville—Drs. Cavitt Kinkle Bartley, Thaxton; William

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Patrick Coleman, Lynchburg; Sterling Randolph Decker, Charlottesville; Patrick Campbell Devine, Norfolk; Julia Emmett Edmunds, Clifton Forge; James Harry Gamble, Marion; David Goodsell Hall, III, Arlington; Edward Harrison Hancock, Jr., Lynchburg; David Benson Kruger, Norfolk; Charles Hunter Montgomery, Lexington, Ky.; Luther M. Talbert, Meadowview; John Herndon Vansant, Chatham; Emery Mittchell Ward, Fayetteville, Ark.

JOHNSTON-WILLIS HOSPITAL, Richmond—Dr. William G. Allen, Jr., Emporia.

MEDICAL COLLEGE OF VIRGINIA HOSPITAL, Richmond—Dr. Walter Fitch Manley, Jr., Roanoke.

NORFOLK GENERAL HOSPITAL, Norfolk—Drs. Alvin Cohen, Petersburg; Royce Linton Holsey, Jr., Portsmouth; Robert Henry Jordan, Charlottesville.

MEMORIAL AND CRIPPLED CHILDREN'S HOSPITAL, Roanoke—Dr. Thomas David McDonald, Roanoke.

OHIO STATE UNIVERSITY HOSPITAL, Columbus, Ohio—Drs. Betty Austin Agee, Warrenton; Richard Bryan Agee, Warrenton; Lester Ray Bond, Roanoke; William A. Scoggin, Liguanea, Jamaica, B.W.I.

CINCINNATI GENERAL HOSPITAL, Cincinnati, Ohio—Drs. John Walter Carlysle Johnson, Jr., Clifton Forge; James Linwood Odom, Norfolk; Samuel Nimrod Whitacre, Cross Junction.

SAN JUAN CITY HOSPITAL, San Juan, P. R.—Dr. Pedro Juan Alfaro, Santurce, P.R.

BARNES HOSPITAL, St. Louis, Mo.—Drs. Fred Berry Ballard, Jr., Chattanooga, Tenn.; William K. Smoth, Jr., Annapolis, Md.

ST. LOUIS CITY HOSPITAL, St. Louis, Mo.—Drs. Robert Bailey Deitchman, Martinsville; Paul Wiley Gordon, Jr., Clifton.

WATTS HOSPITAL, Durham, N. C.—Dr. Otha A. Barnhill, Greenville, N. C.

NORTH CAROLINA MEMORIAL HOSPITAL, Chapel Hill, N. C.—Drs. Alton James Coppridge, Durham, N. C.; Luther William Oehlbeck, Jr., Morgantown, N. C.

REX HOSPITAL, Raleigh, N. C.—Drs. William Harold Lilly, Waynesboro; Bobby L. Smith, Port Republic.

EMORY UNIVERSITY HOSPITAL, Emory University, Ga.—Drs. William Harvey Cabaniss, Jr., Athens, Ga.; Fred Neal Mitchell, Charlotte, N.C.

MCKEESPORT HOSPITAL, McKeesport, Pa.—Dr. James Monroe Carter, Lowesville.

VALLEY FORGE ARMY HOSPITAL, Phoenixville, Pa. (Army Medical Service Hospitals)—Dr. Louis Eugene Jorel, Fairfield.

PENNSYLVANIA HOSPITAL, Philadelphia, Pa.—Dr. John Jennett Neal, Jr., Danville.

ST. LUKE'S HOSPITAL, Denver, Colo.—Dr. Walter Scott Chisholm, Jr., Charlottesville.

HENRY FORD HOSPITAL, Detroit, Mich.—Dr. Angus McDonald Green Crook, Jackson, Tenn.

ST. JOSEPHS HOSPITAL, Phoenix, Ariz.—Dr. Richard Clayton Dinmore, Honolulu, T.H.

CHARITY HOSPITAL OF LOUISIANA, New Orleans, La.—Dr. Robert Kent Dyer, Roanoke.

ST. VINCENT'S HOSPITAL, New York, N.Y.—Dr. Walker Marshall East, Clifton Forge.

LENOX HILL HOSPITAL, New York, N.Y.—Dr. Robert Daniel Gardner, Trenton, N. J.

ST. LUKE'S HOSPITAL, New York, N.Y.—Drs. Douglas Meriwether Griggs, Jr., Charlottesville; Robert Warner Wood, Jr., Charlottesville.

NEW YORK HOSPITAL, New York, N.Y.—Dr. Arthur Gardner Harden, Virginia Beach.

GENESEE HOSPITAL, Rochester, N.Y.—Dr. Carl Peter Kremer, Jr., Great Neck, N.Y.

DR. W. H. GROVES LATTER DAY SAINTS HOSPITAL, Salt Lake City, Utah—Dr. Morris Fine, Norfolk.

GEORGETOWN UNIVERSITY HOSPITAL, Washington, D. C.—Dr. John Happer Furr, Norfolk.

MADIGAN ARMY HOSPITAL, Tacoma, Wash. (U.S. Air Force Medical Services)—Dr. John Thomas Hearn, Jr., Fredericksburg.

VIRGINIA MASON HOSPITAL, Seattle, Wash.—Drs. Noble Thomason Macfarlane, Jr., Charlottesville; Philip M. Sprinkle, Martinsville.

KING COUNTY HOSPITAL SYSTEM, Seattle, Wash.—Dr. Pierre Brutsche Scott, Staunton.

U.S. NAVAL HOSPITAL, Bethesda, Md.—Dr. Jesse Robinson Hicks, Florence, S.C.

JOHNS HOPKINS HOSPITAL, Baltimore, Md.—Drs. Patsy R. Phelps, Charlottesville; John Vernon Torbert, Jr., Chesapeake; Robert William Trever, Arlington; Walter R. Whitehurst, Charlottesville.

UNIVERSITY HOSPITAL, Baltimore, Md.—Dr. Louis Max Sod, Norfolk.

PETER BENT BRIGHAM HOSPITAL, Boston, Mass.—Dr. John Shelton Horsley, III, Richmond.

MASSACHUSETTS MEMORIAL HOSPITALS, Boston, Mass.—Dr. Daniel Nathan Mohler, Charleston, W. Va.

TRIPLER GENERAL HOSPITAL, Honolulu, T.H. (Army Medical Service Hcspitals)—Drs. Sheff

Daniel Olinger, Jr., Big Stone Gap; George S. Schools, Richmond.

LETTERMAN GENERAL HOSPITAL, San Francisco, Calif. (Army Medical Service Hospitals)—Dr. Frank Wilson Price, Delaplane.

CEDARS OF LEBANON HOSPITAL, Los Angeles, Calif.—Dr. Malcolm K. Rosenbaum, Washington, Pa.

HARTFORD HOSPITAL, Hartford, Conn.—Dr. Carnes Weeks, Jr., Woodbury, Conn.

Dr. Charles William Hurt, Culpeper, appointment not yet taken.

American Medical Association.

The meeting in New York City, June 1-5, was the largest ever held by the Association, with the final figures on attendance nearing 40,000. About 18,000 of these were physicians. Highlights of the opening day session were the addresses by Dr. Louis H. Bauer, who reported as retiring president; Dr. Edward J. McCormick who spoke as president-elect; Mrs. Oveta Culp Hobby, U.S. Secretary of Health, Education and Welfare, and the selection of the winner of the 1953 Distinguished Service Award. This award was voted to Dr. Alfred Blalock, professor of surgery at Johns Hopkins University School of Medicine, and chief surgeon at Johns Hopkins Hospital.

Dr. Walter B. Martin of Norfolk, Virginia, was named president-elect of the Association to become president in 1954, and Dr. Carl H. Gellenthien of Valmore, New Mexico was elected as vice-president. Dr. George F. Lull, Chicago, was re-elected secretary and general manager, and Dr. J. J. Moore, Chicago treasurer. Dr. Julian P. Price of Florence, S. C., was elected to fill Dr. Martin's unexpired term on the Board of Trustees.

Governor's Advisory Committee on Tuberculosis Control.

Governor Battle has appointed fifteen Virginians, physicians or medical authorities, "to serve in an advisory capacity to the State Board of Health and to make recommendations and suggestions as it deems appropriate" in the fight to eradicate tuberculosis. The Committee will organize and elect its own chairman upon call of Dr. Shanholtz, Health Commissioner. Members of the new committee are: Dr. John T. T. Hundley, Lynchburg; Dr. Andrew D. Hart, Charlottesville; Dr. Felix J. Brown, Richmond; Dr. Frank R. Trigg, Norfolk; Dr. George W. Oast, Portsmouth; Dr. E. C. Drash, Charlottesville; Dr. Edward S. Ray, Richmond; Col. Richard W. Copeland, director of Welfare and Institutions; R. N. Anderson of State Division of Vocational Education; Dr. L. R. Broome, superintendent of Hilltop Sanitarium, Danville; Dr. J. N. Dudley, commissioner of Health of Roanoke; Dr. S. W. Hughes, Jr., director of Grandy Sanatorium, Norfolk; Thomas Pinckney, Richmond, president of Virginia Tuberculosis Association; and Judge Lawrence Leland Tate, of Virginia Polytechnic Institute, Blacksburg.

The Virginia Surgical Society

Was formally organized at a luncheon meeting held on Saturday, May 23, 1953 at the Richmond Academy of Medicine Building. Officers were elected as follows:

President, Dr. Randolph Hoge, Richmond; Vice-President, Dr. Hugh Trout, Jr., Roanoke; Secretary, Dr. Robert L. Payne, Jr., Norfolk; Treasurer, Dr. William R. Hill, Richmond.

The following men were elected to the council: Dr. E. P. Lehman, Charlottesville; Dr. I. A. Bigger, Richmond; Dr. Edmund Horgan, Winchester; and Dr. R. P. Bell, Jr., Staunton.

The next meeting of the Society will be held during the time of the annual meeting of The Medical Society of Virginia.

National Advisory Committee to the Selective Service.

Arthur S. Flemming, Director of Defense Mobilization, advises that President Eisenhower has asked the members of the Health Resources Advisory Committee of the Office of Defense Mobilization who serve also as the National Advisory Committee to the Selective Service System to continue in their present capacities.

Initially, the Health Resources Advisory Committee was established in August 1950 to advise the National Security Resources Board on the health resources of the Nation as they relate to national defense, but in April, 1952, was transferred to ODM.

In his letter addressed to Dr. Howard A. Rusk, Committee Chairman, President Eisenhower said:

"The health of both our military services and our civilian population is fundamental both in peacetime and in the present emergency, and every effort must continue to be made to insure full utilization of both our civilian and military health resources."

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Members of the Health Resources Advisory Committee are: Dr. Howard A. Rusk, New York, Chairman; Dr. Edwin L. Crosby, Chicago; Dr. Harold S. Diehl, Minneapolis; Dr. Alan Gregg, New York; Mrs. Ruth P. Kuehn, R.N., Pittsburgh; Dr. James C. Sargent, Milwaukee; Dr. Leo J. Schoeny, New Orleans; and Dr. William P. Shepard, San Francisco.

Members of the Virginia Advisory Committee to Selective Service are Dr. J. M. Emmett, Chairman, Clifton Forge; Dr. Harvey B. Haag, Richmond; Dr. Waverly R. Payne, Newport News; Dr. Mack I. Shanholtz, State Health Commissioner, Richmond; and Dr. W. Henry Street (Dental member), Richmond.

Virginia Pediatric Society.

The annual spring meeting of the Society was held at the Williamsburg Inn, Williamsburg, on March 6 and 7, under the presidency of Dr. Paul Hogg of Newport News. An excellent scientific program was presented and several new members were received. New officers elected at this time are: President, Dr. T. Stanley Meade, Richmond; vice-president, Dr. T. J. Humphries, Roanoke; secretary-treasurer, Dr. William Grossmann, Petersburg; and new members of the Executive Committee, Dr. Paul Hogg, Newport News, and Dr. E. L. Kendig, Richmond.

Dr. Beckwith to Be Associated with Dr. Wood.

Dr. Julian P. Beckwith who has for some time been head of the Medical Department of the Chesapeake and Ohio Hospital at Clifton Forge, moved to Charlottesville the first of July, where he will have offices at the University of Virginia Hospital and be associated in practice with Dr. J. Edwin Wood and be assistant professor of medicine.

Dr. Sutton Honored.

In tribute to his twenty-five years' service with the Pediatric Department of the Medical College of Virginia, Dr. Lee E. Sutton, Jr., was honored at a banquet on the evening of May 29 at the Commonwealth Club of Richmond. This was given by past and former members of his staff and he was presented a silver punchbowl appropriately engraved, Dr. Louise Galvin making the presentation. About eighty people attended this anniversary program honoring Dr. Sutton.

Pan-Pacific Surgical Association.

Doctors are urged to make arrangements as soon as possible to attend the Sixth Pan-Pacific Surgical Congress to be held in Honolulu, Hawaii, October 7-18, *1954*. An outstanding program, including sessions in all divisions of surgery and related fields, promises to be of interest to all doctors.

The Association office has been appointed as travel agent for those attending the Congress and it is important that all hotel and travel reservations be made through the Honolulu headquarters of the Pan-Pacific Surgical Association. For further information, please write to F. J. Pinkerton, M. D., Director General, Pan-Pacific Surgical Association, Suite 7, Young Hotel Building, Honolulu, Hawaii.

Dr. and Mrs. William Lawrence Gatewood,

Richmond, left the latter part of May for their summer home at Centerville, Cape Cod, Massachusetts, where they expect to remain until the end of September.

Special Medical Course.

The Special Training Division of the Oak Ridge Institute of Nuclear Studies has scheduled an advanced course covering the clinical applications of radioisotopes to be held from September 14-25, 1953. This advanced course, part of the continuing series offered by the Institute, is the second to be concerned with the medical uses of isotopes. The first was given in March, 1951. Participation will be limited essentially to those physicians who have had clinical experience with radioisotopes.

Information and application blanks may be obtained from the Special Training Division of the Institute, P. O. Box 117, Oak Ridge, Tennessee.

Dr. Candau to Be Director-General of the World Health Organization.

Dr. Fred L. Soper, Director of the Pan American Sanitary Bureau, Regional Office of the World Health Organization, announces the departure of Dr. M. G. Candau, Assistant-Director of the Bureau since March 1952. Dr. Candau was appointed Director-General of the World Health Organization by the Sixth World Health Assembly on May 11 in Geneva. He left Washington on May 30 for a vacation at home in Rio de Janeiro, Brazil, before taking up his new post with the WHO in Geneva, Switzerland, in July.

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Grant Given by Eli Lilly and Company.

The University of Virginia received a grant recently from Eli Lilly and Company. This will support Dr. W. Parker Anslow, Jr., in his study of the mechanism of excretion of sulfur amino acids. Dr. Anslow is chairman of the Physiological Laboratory in the School of Medicine at the University of Virginia.

Dr. R. Bryan Grinnan, Jr.,

Of Norfolk, has been elected president-elect of the Virginia Heart Association and will take office next year.

Dr. Hundley Honored.

The degree of Doctor of Laws was conferred on Dr. John T. T. Hundley by Lynchburg College at its commencement exercises early in June. This honor was given Dr. Hundley, former president of The Medical Society of Virginia, for "leadership in his profession and his service to his community".

Dr. R. S. Griffith,

Waynesboro, has been cited by the Lee Lodge, No. 209, Ancient, Free and Accepted Masons, as the oldest Mason in the lodge in point of service and age. The retired physician became a Mason in 1891.

Borden's Work in Virginia.

A total of $422,854 was spent by The Borden Company in the Commonwealth of Virginia during 1952 for milk and other farm products, payrolls and taxes, according to an expenditure breakdown reported by the Company's Prescription Products Division. This is an increase of $43,984 over 1951.

Altogether, the Company spent $508,172,763 in the United States last year. This embraces activities in 47 of the 48 states, plus the District of Columbia, according to the Division which manufactures and distributes a well-known line of infant feeding formula products. The Company has 764 stockholders in Virginia.

Dr. B. C. Shuler

Of Shenandoah, who has been practicing in that section since 1903, was honored in May when the people of that community presented him with a 50-year plaque. He was guest of honor on that occasion at the dedication of the new Shenandoah Recreation Center, when he cut the ribbon opening a playground which had been built by civic groups and interested citizens.

Dr. Osterud Honored by College Staff.

Dr. H. L. Osterud, who has been teaching anatomy at the Medical College of Virginia for thirty-one years, retired in June and many former students and friends honored him during commencement with a reception and gifts to him and Mrs. Osterud. They also established a Osterud Prize in his honor to be awarded each year to a freshman medical student, beginning in 1954.

Dr. T. J. Tudor,

Norton, was badly hurt on June 7, when he was beaten over the head by an unknown man who came to his office on the pretext of receiving treatment for an injured foot. Dr. Tudor was moved to the local hospital for treatment.

Dr. Lehman to Retire.

Dr. Edwin P. Lehman announces his retirement in September after twenty-five years as a member of the University of Virginia School of Medicine staff. He has been chairman of the department of surgery and gynecology and senior member of the medical faculty. He is well known also for his work in cancer control and is a former president of the American Cancer Society. In 1948 for his work in this specialty he was given the J. Shelton Horsley Memorial Award.

Internist,

Aged 37, draft priority IV, graduate of the University of Virginia, with university hospital training and boards completed, would like to become associated with individual physician or group for practice. Address "Internist" care this journal, 1105 West Franklin Street, Richmond 20, Va. (*Adv.*)

Unusual Opportunity

For Qualified Psychiatrist (Diplomate Psychiatry or Board Eligible) to Direct Private Clinic Team, in city of 25,000 with drawing population of 100,000. Salary range from $13,000-$15,000 per annum with Incentive Factor. Address "Psychiatrist" care Virginia Medical Monthly, 1105 West Franklin Street, Richmond 20, Virginia. (*Adv.*)

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OBITUARIES

Dr. Edgar Lee Lawrence

Of Roanoke, died in a local hospital on March 21 after a lingering illness of several months, following a fracture to the left hip which was sustained by a fall on the steps of his church when leaving the service. Dr. Lawrence was 84 and a native of Floyd County. He graduated from the Medical College of Virginia in 1900, after which he practiced medicine in Floyd, Virginia until coming here in 1919.

As a general practitioner, he enjoyed a large practice in Floyd and also in Roanoke after moving here. He was active in medical societies being a member of the American Medical Association, The Medical Society of Virginia, The Southwest Virginia Medical Society and the Roanoke Academy of Medicine. He was a member of the staff of the Shenandoah and The Memorial and Crippled Childrens Hospitals. He was a member of the Trinity Methodist Church and of several social and fraternal organizations.

Dr. Lawrence was held in high esteem by all who knew him. He lived a life of true responsibility to his profession and to his community. His life was typical of unselfish service characteristic of the general practitioner of his day.

The Roanoke Academy of Medicine feels that a true friend has gone from our midst, and extends genuine sympathy to the surviving members of his family.

GEORGE S. BOURNE
IRA H. HURT
J. D. WILLIS, *Chairman*

Dr. James Henderson Smith,

Widely known Richmond physician, died June 4 of a heart attack. He was seventy years of age and a graduate of the former University College of Medicine, Richmond, in 1910. For many years he served as senior member of the Medical Staff at St. Luke's Hospital, Richmond, was a former president of the Richmond Academy of Medicine, a member of many medical and civic organizations, and had been a member of The Medical Society of Virginia since 1910. He is survived by his wife, two daughters, two grandchildren and several brothers, one of them being Dr. Philip Smith of Abingdon.

Dr. Stephen Watts,

Retired professor of surgery at the University of Virginia, died at the hospital, June 7, aged seventy-five. He was graduated in medicine from Johns Hopkins University, Baltimore in 1901, and shortly thereafter located in Charlottesville. He was professor of surgery at University of Virginia from 1907 to 1928 when he retired. He was engaged in special medical work during both World Wars and was identified with many professional and civic organizations. His daughter and sister survive him, his wife having died last April.

Dr. Isaac S. Tractenberg,

Graduate of the Medical College of Virginia, Richmond, in 1913, died at his home in Lawrence, Long Island, N. Y., February 27, at the age of 66. He had practiced obstetrics and gynecology in Brooklyn for most of the time since he left Richmond, and was connected with Unity Hospital where he was vice-president and president-elect of the medical board.

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